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Hunterian Lecture

ON

THE SURGERY OF THE SPINAL CORD IN PEACE AND WAR.

Delivered before the Royal College of Surgeons of England on Feb. 3rd, 1919,

BY A. J. WALTON, M.S., F.R.C.S., B.Sc.,

ASSISTANT SURGEON AND DEMONSTRATOR OF ANATOMY, LONDON HOSPITAL; SURGEON, POPLAR HOSPITAL, 2ND LONDON GENERAL HOSPITAL, ETC.

MR. PRESIDENT AND GENTLEMEN,—I must first express to you my appreciation of the honour I have received in being asked to give this lecture. It is with some trepidation that I have undertaken the task, for on several previous occasions the subject of spinal cord surgery, in one or other of its many aspects, has been chosen for the Hunterian lecture. It is only because the present war has so altered our views on many points that I have felt encouraged to continue. On the one hand, our knowledge of the symptoms of spinal injury has been enormously increased and the indications for operation much more clearly defined. On the other hand, the prognosis after operation, and especially after the purely exploratory operation so often advised, when really contra-indicated, has been so relatively poor that its value in civilian lesions is tending to be unjustly depreciated. For these reasons I feel hopeful that a brief résumé of our present knowledge of those conditions showing partial or complete lesions of the spinal cord, to which time will alone permit me to give attention, will not be without value.

PATHOLOGICAL CHANGES IN NEOPLASMS AND OTHER LESIONS.

The pathological changes that occur in the cord are very variable. In the case of extra- and intra-dural tumours they consist at first, as Gowers [16] pointed out, of a simple compression, followed by inflammatory changes at a later date. As evidence of compression the cord may be flattened, narrowed, and indented, but shows little or no change in appearance or consistence. Cases that recover after removal of the pressure show no other alteration to the naked eye, and it is probable that on microscopic examination no other change would be discernible. Our knowledge of such cases is, however, slight, for such will recover if treated correctly, or, if left to progress to a fatal termination, will have passed on to a later stage.

In more advanced cases the consistence of the cord alters. It is at first softened, but later its consistency may be increased. The affected part will be grey in colour and on microscopic section will show a general increase of interstitial tissue, degeneration of the nerve elements and abundant masses of myelin. In extreme cases all the fibres may be destroyed, but there is never actual division of the cord itself. These changes may extend for one or two inches on either side of the lesion, and beyond them again the changes of ascending and descending degeneration can be discerned.

Although described as inflammatory in nature, it must be remembered that such changes are in reality only those due to the reaction around destroyed tissues. They are, in fact, reparative and only a means of replacing by scar the already destroyed tissues. They thus do not tend to spread, and may indeed be found in cases of compression where the dura has not been perforated.

The onset of these destructive changes is not due to the site of the lesion, but to the rapidity of its progress. Thus it is that in cases of malignant disease of the vertebræ the so-called inflammatory change is always more marked than the compression, whereas with slowly growing tumours and with tuberculosis of the spine the compression is the more marked factor. This is also clearly shown clinically, and it is well recognised that the more rapid the onset of paraplegic symptoms the less likely is recovery to follow the removal of the compressing agent. Even in inflammatory and malignant neoplastic formations the destruction of the cord is due to the rate of growth and the rapidity of the increase of pressure rather than to the nature of the lesion, for in neither of these two conditions is the cord ever actually destroyed by an extension of the disease.

The same law still holds good, even if the pathological process is situated in the substance of the cord itself. Provided that the change is slow in onset it may exist for a considerable time and yet not lead to destruction of the cord, so that complete recovery may follow its removal. Elsberg [9 10 12] has evolved a technique for the removal of such intramedullary tumours, and has recorded several cases where complete recovery followed the removal. A similar condition may even be seen in centrally situated inflammatory lesions, as in one of my cases where there was a centrally situated tubercular abscess which gave rise to a partial paraplegia. (Case 1.) A case which I believe to be unique in being the only one on record where such an abscess has been opened and a complete cure followed, although Elsberg [13] has reported a somewhat similar one where great relief followed operation.

PATHOLOGICAL CHANGES IN TRAUMATIC LESIONS.

If, then, the general principle be true that the amount of destruction of the cord, and therefore the prognosis, is dependent neither upon the site nor upon the nature of the lesion but upon the rapidity of its progress, very marked changes would be expected from a traumatic lesion where the whole course of the disease is almost instantaneous. Such, indeed, is seen to be the case.

The present war has given us unrivalled opportunities for observing large numbers of traumatic lesions, the pathological changes of which have been carefully investigated by Holmes.[20] He finds that where the cord has been directly injured by the missile or by displaced fragments of bone, a portion of the cord may be disintegrated, so that on incision of the pia a semifluid custard-like material may escape. Around this there are marked œdema and multiple minute hæmorrhages chiefly into the grey matter. The œdema may extend to several segments, and bears no definite relation to the severity of the wound. There are also distant lesions consisting of swelling of the axis-cylinders which may degenerate and disintegrate for a distance of four or five segments beyond the site of the lesion, and irregular patches of focal necrosis with the formation of curious cylindrical cavities, the contents of which consist of degenerating fibres and neuroglia.

Of even more interest than the above are the changes found in those cases where the cord has not been directly injured and the dura is unopened, where, in fact, the changes can only be attributed to concussion or commotion. Even in these cases Holmes [20] found that microscopically there were punctiform hæmorrhages with œdematous swelling and diffuse or focal necrosis, or there might even be complete destruction of all the functional elements of the cord.

Collier [5] believes that the injury in these cases is due to a sudden rise of pressure, and states that the changes are always more marked in the lower part of the cord, as it is more closed below. He also describes two other pathological changes that may occur—namely, organisation of clot around the roots of the cauda equina and total necrosis of the distal portion of the cord, changes which in my experience have been extremely rare.

Claude and Lhermitte [25] have described in detail the changes which they have found to be present in cases of gunshot concussion where there was no visible injury of the cord or meninges. Locally they found, quite apart from hæmorrhage, patches of necrosis which they describe as insular necrosis. These patches are usually situated at the level of the injury, and in them the nervous elements, axis-cylinders, myelin sheaths, and nerve cells are in process of destruction or already completely transformed, whilst the neuroglial elements are proliferating and new blood-vessels are being formed. In some cases the interstitial elements themselves die and the focus is absolutely necrotic. In addition to the above there are diffuse changes which they have called "acute primary degeneration of the spinal tracts." Here the axis-cylinders are seen broken up in larger or smaller fragments and the nerve fibres have for the most part lost their parallelism; they are retracted, curled on themselves, and cross one another. Around the broken fibres are grouped the granular bodies of neuroglial origin. In the grey matter the ganglion cells are loaded with lipochromes and above all the protoplasm appears full of chromophile granules fused in large irregular clumps.

CLINICAL MANIFESTATIONS IN SPINAL TUMOURS.

The symptoms of benign or malignant neoplasms of the spine or of tubercular lesions will be relatively slow in onset, and therefore will tend to be focal in nature. There is thus to a certain extent a distinction according to the situation of the lesion, and the difficulties with which the surgeon or physician will be confronted are rather those of diagnosing the nature and site of the lesion than of determining whether or no a portion of the cord is destroyed. If the pressure can be removed there is every probability that the cord will recover.

In those cases where the disease commences in the vertebræ specific symptoms of such a lesion will not uncommonly be present, and will generally antedate those of interference with the function of the cord or its roots. In tuberculosis, for instance, the characteristic symptoms of pain, rigidity, and deformity will generally have been in existence for a long period before the onset of paraplegia. Similar symptoms may occur with secondary carcinoma, but here the local pain is the more marked. In my own series of cases of this nature severe aching pain, increased by exercise, was very constant, its onset in the majority occurring from three to six months before that of the other symptoms. In one case the period of existence of this pain was difficult to determine, for the patient's condition had been complicated by the presence of a renal calculus, which, added to the fact that he had an old kyphosis dating from birth, greatly increased the difficulties of diagnosis—so much so, in fact, that he was sent to hospital as a case of functional paraplegia.

This localised pain will in the later stages generally be replaced by the characteristic root pain, but the history of its presence in the early stages of the disease will be a valuable indication of the nature of the underlying lesion. For this reason every case showing an onset with such localised pain should be examined for the presence of a primary focus. As Elsberg[12] and Armour[1] have pointed out, this focus is most commonly in the breast, and the spinal lesion may even occur five to eight years after the breast has been removed. These cases are thus more common in women, and most frequently the spinal deposit is found in the dorsal region, and may here, as in one of my cases (Case 2) infiltrate several of the vertebral bodies.

Root Pains.

Of the actual cord symptoms root pains are usually the first to appear. Their presence has generally been taken as an indication that the tumour was extramedullary, but although it is true that severe pain of this nature is more common with such lesions, its value as a means of differential diagnosis is not constant. Elsberg[11] has shown that in his series root pain was not uncommon with intramedullary tumours, and in one of my own cases of this nature a laparotomy had even been performed for this symptom before the patient came under my care. Hunt and Woolsey[21] have found that if such pains are present in intramedullary lesions they are more likely to be unilateral, but in some cases, as in one of my own (Case 3) an extramedullary tumour may be associated with unilateral root pain. It will probably be found, however, that in the latter case the motor loss is confined to one leg, whilst the central tumour is more prone to cause bilateral paralysis.

In a similar way the presence of such pain is not a true indication that the tumour is situated posteriorly or laterally. Although the commonest intradural tumour is the subpial endothelioma, which is generally situated to one or other side and thus is likely to interfere with the posterior roots of one side only, yet even in these cases the pain may be bilateral, and in the rarer cases of osteoma or chondroma arising from the bodies of the vertebræ, of which I have had two cases, the lesion, although situated anteriorly, may give rise to root pain.

It must be remembered also that the position of this pain may, unless care be taken, even give rise to errors in the diagnosis of the level of the lesion. The level of the initial root pain is of the first importance in determining the site of the lesion, but the later symptoms may, as Elsberg[8] has pointed out, suggest a much higher level owing to stasis of the cerebro-spinal fluid. It is thus essential that a careful history be taken of the early symptoms. On the other hand, Hunt and Woolsey[21] have described cases of extramedullary tumours in the cervical region where there was a distinct girdle sensation or constriction situated at the umbilical level which in all cases disappeared after removal of the growth. Reynolds[30] has pointed out what may be the explanation of this—namely, that pain may be due to pressure on the sensory fibres in the cord, in which case it is referred to an area considerably below what one would expect from the situation of the cord lesion. In comparison with these vagaries of the root pains it must be kept in mind that in cases of chronic spinal meningitis, as described by Sir Victor Horsley,[24] there may be a band of hyperæsthesia extending over a relatively wide area. In one of my patients, for instance, there was a bilateral hyperæsthetic area corresponding to the sixth to the tenth dorsal segments inclusive.

Motor Symptoms.

The motor symptoms will to a certain extent depend upon the site of the lesion. It is well known for instance that in cases of tuberculosis of the body of the vertebræ the earliest symptoms are generally those of spasticity followed by loss of power. These cases are, however, rather exceptional in that when the disease is extradural the pressure, probably owing to the interposition of the cerebro-spinal fluid, is usually more diffuse, and for the same reason the motor symptoms below are frequently bilateral. On the other hand, they are generally unilateral when the lesion is situated within the dura. In the common type of subpial endothelioma, for example, the Brown-Séquard syndrome is often found in the early stages. In both my cases of osteoma of the vertebra the paralysis below the lesion was unilateral, for in these cases the tumour grew forward, so that it projected within the dura and was only covered by a thin layer of stretched-out tissue, and thus, although pathologically extradural, was clinically within this membrane. It may be said, therefore, that the presence of a local or unilateral paralysis is more in favour of an intradural lesion, and this is also true in those cases of bilateral symptoms where one leg was clearly affected previously to the other.

As a general rule the paralysis below the lesion is of the spastic type. Later, and especially with more rapidly increasing pressure, the limbs may become flaccid with loss of tone. It is on such cases that the older views of the association of a complete lesion with flaccidity and loss of tone were based. In view of the more recent knowledge gained by our experience of war surgery it is probable that these views will have to be modified. It is possible that this condition of flaccidity may be found when cases are more carefully examined to pass off and be followed by a condition of extensor spasm; if the disease be not, as is so often the case, associated with sepsis of the urinary tract.

At the level of the lesion itself there will be a segmental paralysis of the lower neuron type with wasting and complete flaccidity. This symptom is of great value in locating the level of the lesion in the cord, and may not uncommonly, indeed, be of more value than the level of the sensory changes. The local paralysis may, if located to the erector spinæ muscles, give rise to a scoliosis, to which treatment may in the earlier stages be alone directed, as in a case recorded by Harris and Bankart.[17]

Sensory Changes.

The presence of sensory changes below the level of the lesion is extremely common. Hecht[18] even goes so far as to say that "Some disturbance of sensation, most commonly of the tactile variety, will be present in all tumour cases. I should even say must be present." He states that a positive diagnosis of a spinal tumour has never been made in the complete absence of objective disturbance.

The amount of sensory loss will vary with the site and rate of growth of the tumour. As in the case of the motor symptoms extradural lesions will usually give rise to a more diffuse pressure on the cord and hence all types of sensation are likely to be affected. Although in the more slowly increasing tubercular lesions there is no loss of sensation except in the late stages, in cases of secondary carcinoma the reverse is true, and the most common change is a rapidly increasing loss to all forms of sensation, until in a short space of time all are absent. Such, in my experience, has been the invariable condition with this lesion.

With intradural lesions it is usually believed that the extramedullary give complete loss of sensation, while the intramedullary show marked dissociation. This does not, however, appear to be true. It would rather seem that the dissociation is only found, as would, indeed, be expected,

with slowly growing tumours. Thus in my two cases of osteomata there was marked dissociation in the legs. In a similar manner it may be found that a slowly growing subpial endothelioma presents a marked dissociation, as in Case 4, where a tumour of 1 cm. diameter had developed in seven months, whereas in a second case of a similar tumour which in seven months had grown to a diameter of 3 cm., there was complete loss of all sensation. Rapidly growing extramedullary sarcomata, in my experience, have invariably shown complete loss of all forms of sensation below the level of the lesion.

With intramedullary lesions it is more common to find in the early stages a loss to pain, heat, and cold, with an absence of vibration sensation over an extensive area, whereas in extramedullary lesions this loss is generally over a much smaller area than that in which the other forms of sensation are absent. This, however, is by no means constant, and Elsberg[11] has reported cases among his series of intramedullary tumours where there was no dissociation and root pains were present. It is in the more rapidly increasing lesions, as, for instance, a hæmorrhage, that the widely spread loss is found, whereas with a slowly increasing syringomyelia the dissociation is most marked.

Just as the level of the root pains may be deceptive as a means of diagnosis of the position of the lesion so also may the sensory loss be other than would be expected. As a general rule the upper limit of the loss is apparently too low. Reynolds[10] has pointed out that this is especially so on the back, and he quotes a case where a lesion at the level of the sixth dorsal segment gave rise to anæsthesia on the front of the body up to the level of the seventh dorsal segment, but on the back of the body only up to the level of the eleventh dorsal segment. It has already been noted that an increased collection of cerebro-spinal fluid above the lesion may give rise to a diagnosis of pressure at a level higher than the situation of the tumour.

Reflexes.

Until investigations had been carried out on the large amount of material supplied by this war the condition of the reflexes in lesions of the cord was regarded as settled. In spite of the work of Sherrington on animals and the clinical findings of Bramwell and Gowers the changes were regarded as simple and constant. In all incomplete lesions the reflexes in the part below were regarded as being exaggerated, the plantar reflex was up, ankle and knee clonus were often obtainable, and all the tendon reflexes were increased. In the segments corresponding to the actual lesion the reflexes, both superficial and deep, were abolished. There is no doubt that this is the characteristic condition with incomplete lesions resulting from tumours of slow growth but rapid changes—e.g., hæmorrhage into the growth may produce at first a picture of flaccid paralysis similar to that of the first stage of a complete division, but during the second stage of reflex activity the picture alters.

It is as regards the changes in the reflexes with complete lesions that our views have undergone the greatest change. In the later stages of a tumour there usually occurs, as described by Bastian, a stage with complete paralysis and absolute loss of all reflexes and loss of tone. Such had come to be regarded as the characteristic change with a complete lesion and any return of reflex activity was regarded as evidence either that the lesion had been incomplete or that recovery was occurring. It must be remembered here that since with a tumour there is never complete destruction of the cord it is therefore more difficult to prove that its functions are permanently destroyed. Moreover, these cases are but rarely the healthy subjects such as are seen with complete division from military wounds and being therefore more liable to suffer with septic complications but rarely pass from the stage of complete loss of reflexes. With the increase of our knowledge there is no doubt that these symptoms in advanced cases of spinal tumour will have in the future to be examined from a different aspect.

It is evident, therefore, that neoplastic formations interfering with the functions of the cord will give rise to focal symptoms which may remain localised for a very prolonged period. The destruction of the cord will vary with the rate of growth of the neoplasm, and in slowly growing tumours may be relatively slight, while in the more rapidly growing ones, although of relatively small size, much permanent damage may be caused. Owing to the comparatively slow progress of the disease treatment will probably be sought long before there are symptoms of a complete transverse lesion. In attempting to determine the site of such a tumour careful consideration will have to be given to each group of symptoms, for any one alone may give rise to a fallacious diagnosis. The apparent limitation of the lesion to one or more tracts is not a certain indication of the site of the neoplasm, although it is well to remember that intramedullary lesions will tend to spread up and down the cord, whereas with the growth of an extramedullary tumour the symptoms will increase in width—i.e., to involve more and more tracts.

CLINICAL MANIFESTATIONS IN TRAUMATIC LESIONS.

With a traumatic lesion of the cord the problem is very different. Owing to the acuteness of the lesion, the whole process of which is almost instantaneous, there will at first be a complete loss of function of the portion of the cord below the injury giving rise to a flaccid paralysis, and this is true even in those cases where there has been only partial or even no anatomical destruction of the cord. It is only later when the lower segment has recovered from the condition of shock that it will be possible to determine whether the whole of the cord has been destroyed, or whether there is a local injury which may recover with or without the help of operation.

A consideration of the pathological changes has shown that where there is even partial destruction of the cord by the passage of the missile the lesions are widespread and that recovery is therefore unlikely to occur. Hence, if the paraplegia remains complete the prognosis will generally be poor. X ray examination will always be of great value, not only in determining whether the missile or displaced bone has actually destroyed a portion of the cord, but it may often enable the surgeon to ascertain the path of the bullet and thus diagnose with fair accuracy whether or no the cord has been in part or wholly divided. The greatest disappointment is, however, caused by those cases in which perhaps the dura has not even been perforated and yet a permanent paraplegia has been caused.

The majority of traumatic lesions are followed by the onset of paraplegia, but there are many exceptions to this rule. In civilian cases cervical injuries not uncommonly are free from spinal symptoms; according to Armour,[1] this is true of one-third of the cases. Campbell[2] has also reported six cases of fracture of the bodies of the lumbar vertebræ where there were no symptoms referable to the cord or cauda equina. In others, again, the symptoms may be only partial, but even here they may be progressive, and this from various causes. Holmes,[20] for instance, describes cases where the symptoms increase after two to three days, probably owing to the onset of secondary hæmorrhage or progressive softening. Mixter and Osgood[28] have also described late symptoms due to the gradual onset of myelitis by the irritation of long-continued abnormal position or callus formation. Neuhof[21] reports the onset of paraplegia after many months of apparent cure owing to a rarefying osteitis of the bodies of the vertebræ, so that with the onset of spinal symptoms a kyphosis is caused—the so-called Kuemmell's disease.

In all of such cases the extent and site of the lesion are clearly defined, but where the paraplegia is at first apparently complete it is possible that only a portion or indeed none of the symptoms may be due to irrevocable injury of the cord. This is specially so in lesions of the cervical region, Marie and Benisty[23] describing a series of six cases due to wounds where the paralysis did not remain complete for more than a few weeks. Claude and Lhermitte[24] have likewise seen cases of this transient quadriplegia produced by concussion in the upper cervical region. In addition they describe cases of primary brachial monoplegia occurring both as a flaccid and secondary spasmodic type. It is usually associated with subjective or objective sensory disturbance of radical distribution which is often very obstinate. In other cases there is a brachial diplegia following injuries of the nape of the neck, so that the curious condition may be seen of a man standing and walking about with the completely paralysed upper limbs hanging inert by his side. Here also there are sensory changes, the deep sensibility and tactile sense being chiefly affected. There is frequent want of coördination of the movements of the lower limbs noticeable in the erect attitude, and becoming manifest in the upper limb as

movement reappears, all manifestations of cerebellar nature. A similar condition of temporary paraplegia may follow lesions of the dorsal region, the motor and sensory functions, apparently much involved, being re-established to some extent after a few weeks.

Since the whole question of operative interference will depend upon the diagnosis of an incomplete lesion it becomes a matter of considerable practical importance to determine upon what symptoms such a diagnosis can be made. It is becoming more and more clear that in the early stages there are no distinctive symptoms. In either case there may be within a day or two of the wound a complete flaccid paralysis to the level of the lesion, sensory loss to a similar level, the absence of all reflexes, and retention of urine. In those cases where there is return of some form of sensation and of motor power it is evident that the lesion is incomplete. It is in the less well defined cases where there is alteration in the reflexes alone that the greatest errors have arisen, and many such cases have been operated upon because it was believed that the lesion was incomplete, whereas there was in fact a complete division of the cord. On the other hand, the change in the nature of the reflexes is often the first indication that the injury is only partial and that an operation should be undertaken. It is the failure to recognise these points of distinction between complete and incomplete lesions, and the tendency to operate on those cases where the cord is destroyed for one or more segments and where therefore the prognosis is hopeless, that has brought discredit upon this branch of surgery.

Reflexes.

The changes in the reflexes have been fully described in a most able paper by G. Riddoch,[31] which should be consulted by every surgeon and physician interested in this type of injury. He shows that in cases of acute trauma there are three stages in the clinical picture.

Firstly, there is the period of flaccidity, during which no distinction can be made between a complete and an incomplete division. There is a flaccid paralysis of all the muscles below the level of the lesion with loss of muscular tone, complete loss of all forms of sensation to a similar level, and the abolition of all spinal reflexes, the only exception to this latter being tonic contraction of the sphincters of the bladder and rectum (probably the internal sphincters supplied by the sympathetic fibres).

Secondly, there is the stage of reflex action during which the differential diagnosis can be made. If the lesion is complete there is a gradual reappearance after one to three weeks of the flexor reflexes. At first only induced by noxious stimulation of the skin or deep tissues, they are later brought out by the slightest touch or even by jarring of the bed. At the same time the reflexogenous area rapidly increases, so that in a short time stimulation of any portion of the skin almost up to the level of the lesion may induce dorsiflexion of the toes and flexion of the ankle, knee, and hip. The mass reaction may even spread to the abdominal muscles and bladder, and generally is associated with a similar flexion reflex of the other leg. This flexion reflex is not followed by contraction of the extensors, as it is in cats and dogs. Should the knee-jerk, ankle-jerk, and ankle clonus be present they always appear later than the flexion reflex, and the knee-jerk shows a quick falling away of the contraction of the extensors. With the complete establishment of the flexor reflexes there are involuntary flexor spasms of the legs, return of some muscular tone, and automatic action of the bladder and rectum. Case 5, which has been reported in full by Riddoch,[31] shows clearly the nature of these reflexes.

It is the appearance of such a picture as described above which has not only often led to the belief that the lesion was incomplete, but has given rise to the hope that recovery has commenced after some operative measures have been undertaken. When the physiological division is incomplete the reflexes are very different, and this is even so in those cases where there is still loss of voluntary power and sensation. The postural or static reflexes recover at the same time as the flexors, so that the flexion movements are much more gentle and controlled owing to contraction of the extensors, and may be accompanied by extension of the knee and plantar extension of the toes of the other leg. After a short period the stimulated leg extends and the opposite leg flexes, giving a diphasic or stepping movement. The reflex is not so widespread—i.e., local signature is present, so that the abdominal muscles are not involved, and the limbs lie in the bed extended at the hip and knee. In fact, as a rule the flexion reflexogenous area is limited to the periphery, and above this nociceptive stimuli give extension of the limbs. The knee-jerks are present and well sustained, and there is a definite extensor thrust on dorsiflexing the ankle. Case 6 is a good example of such a lesion and shows clearly the differences in the character of the reflexes from those in Case 5.

The third stage is that of the presence of septic complications, and its onset may be delayed for a prolonged period. In the presence of septic broncho-pneumonia, pyelitis, or bed-sores the reflex activity may be diminished and the limbs pass again into a stage of flaccidity, to be replaced by the onset of reflexes as the sepsis passes off.

Progress of Cases.

A certain number of cases may pass through the stage of flaccidity, and, having been clearly identified in the stage of reflex activity as incomplete lesions, may, without operative interference, make steady progress towards recovery. At a later stage, usually from one to two years after the infliction of the wound, progress may be interrupted or a recession occur and at operation the characteristic appearances of meningitis sèrosa be divulged. The presence of such a complication can generally be determined by the nature of the symptoms. The area involved in the root pains will increase, so that instead of being limited to one or two segments, five or six may be involved. There will be a steady increase of the spasticity, either flexor or extensor, and a corresponding decrease of voluntary control. The sphincters, however, will be but rarely affected, so that if the sphincter control be regained it will not be again lost. In some cases, however, if the lower sensory roots are affected true rectal incontinence may be simulated by loss of anal sensation.

INDICATIONS FOR OPERATION.

Before any operation upon the cord is undertaken the surgeon must have clearly in view what benefit is likely to accrue to the patient by such intervention. It would appear to be self-evident that it is useless to remove an aseptic bullet when the cord has been completely divided, or a tumour when the functions are irrevocably destroyed. A review, however, of published cases shows that these points are not kept clearly in mind, and many cases are subjected to operation when there is no possibility of improving the conditions.

Neoplasms and Other Lesions.

A consideration of the pathological and clinical factors makes it clear that the problem presented by the slowly progressive neoplastic cases is very different from that with the traumatic lesions. In the former the damage is almost wholly due to pressure, so that the removal of such pressure is likely to be followed by a complete cure. This may be true even when the symptoms of paraplegia are complete, provided that they have only been present for a short time and there are no septic complications such as cystitis or bed-sores. It is only in the later stages that the destruction becomes complete and return of function impossible. The slower the progress of the disease the less likely is it that inflammatory or degenerative changes have taken place in the cord. This is true even for intramedullary lesions of slow growth. It is now clear that many such lesions may be operated upon with a very good chance of removal and a complete or nearly complete recovery of the functions of the cord. The problem here, then, is relatively easy of solution. The rule will be to operate and remove the pressure and to operate at as early a stage as possible before any permanent damage has been done to the cord. One has rather to consider what are the exceptions to the rule. It must be remembered here that a well-conducted laminectomy carried out with careful technique where there is no septic wound is a proceeding almost devoid of all risk.

The first group of cases in which laminectomy should be postponed or not undertaken is that in which the lesion commences in the bone. Of the two main varieties tuberculosis is almost certain to be cured by rest and adequate orthopædic measures. It is only when such measures have been carefully undertaken and have failed that operation for the relief of paraplegia should be considered. Neoplasms, on the other hand, if capable of being diagnosed as situated within the bone, are almost certain to be malignant and

generally secondary to carcinoma elsewhere. Operation will therefore never be undertaken in the hope of effecting a cure, and only very rarely as a palliative measure—e.g., for the relief of severe root pains.

Before operation is undertaken, the possibility of the symptoms being due to acute myelitis or a softening of infectious origin should always be considered, for in such cases the progress will probably only be accelerated by operation. At the present time cases of disseminated sclerosis should always be eliminated as there is no evidence that such a condition can be relieved by these measures. The elimination is not always simple. In one of my own cases there were well-defined focal symptoms of a lesion at the level of the fifth lumbar segment, the only symptoms pointing to disseminated sclerosis being the presence of a well-marked lateral nystagmus. Syringomyelia as a general rule is too diffuse to be relieved and the operation should therefore only be undertaken after careful consideration if there are definite level signs. All other cases, whether the symptoms point to an intra- or extra-medullary lesion, should be operated upon without delay.

Traumatic Lesions.

When the damage is due to injury the problem is very different, and even before our knowledge had been increased by the experience gained in this war many surgeons were becoming doubtful as to the value of operative measures. We were passing through an intermediate stage in which the views of surgeons, as expressed in their writings, were very diverse. Thus, on the one hand, Sir V. Horsley,[22] Schachner,[24] and Armour[1] advocated early operation, stating that in all cases of doubt an exploration should be carried out. At the other extreme Neuhof[25] took a very conservative view, and after discussing the contra-indications only advised interference where there was evidence of progressive intradural hæmorrhage, as shown by repeated lumbar puncture or unquestionable proof by the X rays that a fragment of bone was encroaching upon the spinal cord at the level suggested by the symptoms.

The majority of surgeons such as Hughes[23] and Elsberg[9] adopt, however, a somewhat intermediate attitude, and whilst decrying operative intervention in the early stages, suggest that it is indicated when there are signs of recovery, pointing to the fact that the cord has not been wholly divided. In regard to the evidence of an incomplete lesion, a statement of the latter surgeon is of considerable interest when compared with the work of Riddoch.[31] He pointed out that an upgoing movement of the toes replacing a downgoing movement when the sole is scratched, is of very great significance as evidence of the transmission of some nerve impulses through the cord. This had been generally accepted until Riddoch pointed out its fallacy. This latter observer has made clear that this change is simply the first stage in the appearance of the flexion reflex. The various stages in any lesion, whether complete or incomplete, when the cord is passing out of the influence of shock, are probably as follows. On scratching the sole of the foot the earliest response is a downgoing adduction movement of the toes; later with this the hamstrings can be felt to contract. Later still the toes move up and abduct, the foot is flexed at the ankle, and the hamstrings and the flexors of the hip contract.

A study of the pathological changes shows that in these traumatic cases, in the early stages, at least, the damage is practically never due to pressure. In both the civilian and military lesions what damage there is is done at the time of the injury, and is due to the momentum of the body. Any increase in the destruction of the cord, if it appear within a short time, will be due to inflammatory changes secondary to the infection of the wound, or if due to long-continued irritation of a foreign body, either metal or bone, will only appear after a prolonged interval. It will therefore be seen that there is no indication for immediate operation for the purpose of removing depressed bone or metal. These structures have already done all the damage they will do, and their mere removal will do nothing to restore the portion of cord already destroyed. On the other hand, the operation may do much to depress further the already lowered vitality of the patient. If, however, the damage is merely due to concussion and the cord is not completely divided, a foreign body may, after a prolonged period, give rise to secondary changes which may cause permanent damage to the cord, and hence its removal becomes imperative. In other words, operation should not be undertaken until there is evidence that the lesion is incomplete, but when such evidence is present interference should not be delayed.

It is therefore of considerable importance that the points of distinction between a complete and an incomplete lesion, as enumerated by Riddoch,[31] should be clearly understood. In my earlier series of war lesions it was my custom to operate upon the majority of cases presenting evidence of a lesion of the cord, and nothing has been more disappointing than those cases where there was a bullet, a piece of metal, or a piece of bone lying outside but compressing the uninjured dura, with the cord apparently intact. In not a single case showing no previous sign of recovery was there any progress after removal, but if operation had only been undertaken when there was some such evidence that the cord was not completely divided, then a marked progress, even if not complete recovery, followed the operative measures.

Selection of Cases for Operation.

Hence it may be stated that in the early stages no operation should be undertaken unless there is some sign of recovery or the lesion is incomplete, in which case the earlier the operation is performed the better. There may be an apparent exception to this rule. It is possible that in certain cases presenting an irregular septic wound operative steps in line with those carried out for other wounds and aiming at the excision of the wound and septic focus would be of considerable use in the prevention of meningitis. They would be instituted solely for the prevention of infection and not for the removal of pressure, but the full technique of such a method would, of course, include the removal of any missile or displaced portion of bone. If any such series of early operations have been performed their results have yet to be published.

In later cases the problem is much more simple. Should symptoms develop at a later date they will be due either to the collection of inflammatory exudates, to the contraction of scar tissue, or to the excessive formation of callus. In each case they are directly due to pressure for the relief of which an operation should be performed without delay. It may occasionally happen that even where there is evidence of complete division of the cord the presence of severe root pains may make the patient's life unendurable, and since such cases may otherwise live in comparative comfort for three or more years an operation devised solely for the relief of this pain will be quite justifiable.

A word must be said here about operations undertaken for the purpose of repairing an injured cord either by suture or by grafting in other, usually heterogeneous, cord tissue. Such methods have been advocated[27] but, unfortunately, the details given of the cases were so meagre as to be of but little value, and although great stress was laid upon the condition of the reflexes they would appear to be only those which would be expected to be present in a cord which was recovering from shock after partial division. All available evidence must be taken as absolutely negative to the possibility of any such recovery—a recovery which could, indeed, not be expected—occurring after suture or cord-grafting. It should never, therefore, be advocated, for not only is it a distinct risk to the life of the patient, a source of disappointment to himself and his friends, but it is also likely to bring the operation of laminectomy, performed for whatever cause, into considerable disrepute.

OPERATIVE TECHNIQUE.

In an operation of this nature the technique will vary considerably in the hands of individual surgeons, and as each man perfects his own methods so will it be found that equally good results will follow. There are certain details, however, which the extensive experience provided by the present war has shown to be important.

The first essential is a wide exposure of the lesion. The incision should be at least six to eight inches long, but whether made as a straight incision or as a lateral flap will depend upon the circumstances of the case. The first method will give less hæmorrhage as fewer subcutaneous vessels will be divided, but with a mid-line wound is more likely to pass through the infected focus and does not give so firm a scar if any mild infection be present. It may therefore be said generally that the vertical mid-line incision should be the one of preference, but should be replaced by a lateral flap if there be an old mid-line wound. If the wound be recent and an operation be considered necessary the incision will be in the line of the wound, the treatment

being directed rather towards the sterilisation of the wound than to the exploration of the spinal cord.

The erector spinæ muscles having been separated from the spines and laminæ, for which purpose a wide-bladed sharp chisel will be found most useful, the spines should be removed with powerful cutting forceps, leaving the surface of the laminæ as smooth as possible. Here again a wide exposure is essential. In every case at least four spines should be removed, and not uncommonly it will be preferable to take away five or six. The risk is not increased thereby, and nearly all the difficulties that may be experienced are due to the fact that insufficient spines have been removed. In the preceding stages there is often a considerable amount of hæmorrhage, which is mainly venous and can readily be controlled by packing the wound with gauze. Occasionally a few points may have to be tied.

Many different methods have been advocated for opening the canal. The safest and most rapid will be to trephine a healthy lamina, preferably not directly at the site of the lesion, so that opposite the trephine opening the dura will be free from the bone. The circle of bone having been removed the dura is freed from the under surface of the lamina above and below with a Horsley's elevator and the bone divided with sharp, narrow-bladed bone forceps. At least three laminæ should be removed, so that adequate exposure is obtained. The opening in the canal is now widened on either side with guillotine forceps in its entire length, and all fat and blood-clot carefully removed from the underlying dura. The extradural space can now be freely examined for any loose fragments of metal or bone, or for any other abnormality and the character of the dura, whether thickened or adherent, whether pulsating or not, noted.

The question will now arise as to whether or no the dura should be opened. If it appear abnormal—that is to say, if it be thickened or show no pulsation this step should unquestionably be undertaken. It is in those cases in which a lesion is clearly situated extradurally and the dura and cord appear normal that difficulty will arise. The natural tendency is to feel that with the removal of the extradural lesion everything has been accomplished and nothing further should be done. Provided, however, that there is no septic extradural focus it will always be better to examine the cord. The lesions of this war have shown especially that even with an uninjured dura there may be gross change in the underlying cord, and although in such cases but little could be done of a curative nature, yet even in them there will be no increased risk, and much help may be obtained in giving an accurate prognosis. If there be a definite septic focus outside and no visible lesion of the cord or dura it will be better not to open this latter structure.

Before the dura is incised all bleeding should be controlled and all blood-clot removed. A mid-line incision is then made with a sharp tenotomy knife, care being taken that the arachnoid is left untouched. If healthy, this latter structure will bulge through the dural incision as a clear transparent bladder filled with cerebro-spinal fluid, and any increase in the amount of fluid or abnormal adhesions will be clearly discernible. Having been examined it can be divided and the cerebro-spinal fluid allowed to escape. If the fluid had been under pressure pulsation, previously absent, may now return.

The cord is examined and any extra- or intra-medullary change noted. Extramedullary tumours will be clearly defined and may be removed, every care being taken that the cord is manipulated as little as possible. If it be necessary to displace it, it should be lifted by one of the slips of the dentate ligament. Should the presence of an intramedullary tumour be shown by a localised swelling of the cord, a small vertical posterior incision should be made and the tumour allowed slowly to extrude, so that, as described by Elsberg,[10] it may be removed by a second operation after seven to ten days' interval. Even if the tumour be irremovable by such methods the case recorded by Clarke and Lansdown[3] would hold out hopes that improvement might be looked for by the application of radium at this stage.

In cases of injury examination should be made for the presence of foreign bodies or portions of bone in the substance of the cord, for, provided that the symptoms were those of an incomplete lesion, the removal of such a foreign body may be followed by very marked improvement, as in one of my own cases where a piece of bone was embedded in the posterior columns, giving a Brown-Séquard paralysis, which largely cleared up after removal of the fragment, and in a remarkable case reported by Schachner,[32] where the removal of a ·22 bullet from the posterior columns was followed by a marked recovery.

The presence of an intramedullary hæmorrhage may be indicated by a swelling of the cord, in which case improvement may follow a small posterior incision and evacuation of the blood (Allen's method). It will often be found, however, that such an incision will be followed by the escape of a custard-like material, showing that the cord is disintegrated and recovery impossible.

If the operation has been performed for the relief of root pains care should be taken that a sufficient number of roots are divided. This is more especially so if the underlying lesion is a meningitis circumscripta, in which case it may be necessary to divide as many as five or six in order to give relief. At the completion of the operative steps upon the cord the dura should be sutured with a few fine catgut sutures, except in the case of serous meningitis, when it should be left open for the fluid to drain into the muscles. In all cases, and especially in this latter condition, the muscles must be carefully closed in layers to prevent any subcutaneous collection of cerebro-spinal fluid, which not uncommonly has a very irritating effect upon this tissue and may cause the wound to break down. Unless there is deep sepsis it will never be necessary to drain the wound.

APPENDIX: ILLUSTRATIVE CASES.

Tubercular Abscess in Substance of Cord.

In this case of tubercular abscess in the substance of the cord operation was followed by complete recovery.

CASE 1.—A male child, aged 5, was admitted to hospital on June 26th, 1916. One year before admission he developed pneumonia, which was followed by a left-sided empyema. After operation he remained well until six weeks before admission, when he fell down whilst playing with a hoop, and has been unable to walk since. The difficulty in using the legs had increased, and for three weeks he had had incontinence of urine.

He was well developed mentally and physically, and there were no signs of active trouble in the left lung. He was unable to walk alone and on being supported stood with a wide base. On attempting to walk the legs were moved with a high-steppage gait, the feet were plantar flexed, and he was unable to get his heels to the ground. All movements of the legs were spastic, very irregular, and ataxic, so that he could move them but little. The reflexes were all increased in the legs, the plantars being definitely up, and ankle and knee clonus being easily elicited. The lower abdominals were greatly increased, but the upper were normal. The arms were normal in all respects.

Sensation appeared to be affected but little, but the results of examination were doubtful in so small a child. There was incontinence of urine and feces. The spinal column showed no change in shape or rigidity and an X ray photograph gave no evidence of spinal disease, but there was a cavity in the head of the left sixth rib suggestive of tubercular osteitis.

Operation was performed on June 28th.

The spines of D. 3-10 were removed and a small cavity, quite localised and apparently tubercular, opened in the head of the sixth rib. On removing the lamina of D. 5 the cord was seen to be swollen opposite its lower border. Free exposure showed that this swelling extended to the upper border of D. 7. Above this swelling the cord pulsated, but below there was no pulsation. The meninges were opened above, and here a normal cord was seen, but below at the site of the swelling it was firmly fused with the meninges. The swelling was carefully opened by a vertical mid-line incision on its dorsal aspect, and about half a drachm of pus removed from the centre of the cord. The wall of the abscess was formed of thinned and flattened cord tissue. There was no lesion of the bone and the dura was freely movable over the surface of the vertebræ. There was no visible communication between the cavity in the head of the sixth rib and the spinal canal. The edges of the opening in the cord were sutured with fine catgut and the wound closed.

Healing took place without complication and the pathological report on the pus (Dr. G. T. Western) showed the presence of tubercle bacilli on August 13th. The patient was sent to a convalescent home, being able to walk with assistance, but all movements being still very spastic. On return from convalescent home on Oct. 10th he was walking perfectly and able to run. There was complete control of the sphincters, but all reflexes were greatly increased.

On Jan. 16th, 1918, he was normal in every respect, but the knee-jerks were, perhaps, a little more brisk than normal. All movements of the legs, walking, and running were quite unaffected.

Secondary Carcinoma of Vertebræ.

The next case is one of secondary cuboidal-celled carcinoma of the vertebræ.

CASE 2.—Patient, aged 58, first noticed the onset of severe pain in her back in February, 1917, following an attack of tonsillitis. It was treated as lumbago. This improved with rest, but in the early part of July she noticed severe pain of a somewhat different nature. It was under the shoulder blades and passed right round the thorax and abdomen, feeling like a band about two inches wide. In the middle of July she noticed "pins and needles" in both feet, but chiefly in the left, and at the same time the left leg became weak, to be followed shortly afterwards by weakness of the right leg. This weakness had been increasing steadily and she had been losing all feeling in the body below the waist. Two weeks ago she first had difficulty in passing urine and at the time of admission to hospital on August 3th, 1917, had to have a catheter passed twice a day.

The legs lay extended flat in the bed and there was no voluntary power of any movement in them, but when they were touched there were involuntary movements of contraction of the hip flexors and hamstrings, the legs being usually drawn up. The reflexes were all increased, the plantars were up, ankle clonus present and the knee-jerks greatly increased. The abdominals were all absent. There was complete loss to all forms of sensation, including vibration, up to the level of the ninth dorsal segment. Above this area of loss was a well-defined band of hyperæsthesia about two inches wide (Fig. 1). There were

retention of fæces and constipation. The X ray of the spine showed no abnormality and no primary growth could be found in the breasts, thyroid, or abdomen.

Operation, August 11th, 1917. A flap incision was made, exposing the spines of D 4–12, and these spines removed. The laminæ of D 7, 8, and 9 were excised and a mass of soft gelatinous growth seen spreading from the bodies of the vertebræ around the dura. The upper and lower borders of the growth were not delimited, but a portion was removed for microscopic examination and the wound closed. The pathological report showed a secondary small spheroidal-celled carcinoma. Progress was steadily downhill, death occurring in the middle of September.

Ossifying Chondroma.

In this case the lesion was ossifying chondroma of the body of the vertebra.

CASE 3.—A man, aged 44, was admitted to hospital on Feb. 29th, 1916. Four months before he had noticed the onset of pain in the back and passing round the left side of the chest. Two weeks later numbness started in the right foot and soon passed up the whole leg. Two months before admission the left leg commenced to be weak in walking, and two weeks ago numbness began in the left foot and had continued since, but had not spread up the leg. There had been no trouble with micturition.

On admission he was found to walk with great difficulty, keeping his eyes upon the ground. The right leg was ataxic and the left was both ataxic and spastic. When the eyes were closed he was unable to keep upright. All the movements of the left leg were performed very slowly on account of the rigidity, but he could flex and extend his toes, and the individual movements, although very spastic, were strong. All the movements of the right leg were strongly and quickly performed and were not incoördinate when the eyes were open, but when he closed his eyes they were extremely ataxic.

He complained of numbness in the right leg up to the hip and some numbness in the left foot. There was no loss anywhere to cotton-wool, but complete loss to prick, heat, and cold over the right leg up to the hip (*vide* Fig. 2). There was total loss to vibration in both legs nearly up to the level of the loss of prick. It was completely lost even in the left leg, where sensation to cotton-wool was still present. In the left lower extremity and the right toes and ankle there was complete loss to the power of recognising passive position. There was a band of definite hyperæsthesia on the left side corresponding to the eighth dorsal segment.

The reflexes in the left lower limb were increased, the ankle- and knee-jerks being greater than on the right, and on this side the plantar reflex was up. When he sat up there was a slight curve at the level of the eighth dorsal spine, evidently due to relaxation of the muscles, especially on the left side.

Operation was performed on March 25th, 1918.

A large rectangular flap was turned over to the left, exposing the spines of D 4–12 and the spines and laminæ removed in the usual way. The cord was seen to be slightly displaced and a tumour was felt anterior to it at the level of the eighth dorsal vertebra. The dura could not, however, be peeled off the tumour. It was therefore opened and the cord gently pulled over to the right by means of a slip of the dentate ligament. At this level the cord was seen to be compressed by a small hard white tumour which was firmly attached to the posterior surface of the body of the vertebra rather to the left of the middle line. With a small chisel the tumour was removed from the surface of the bone after the dura around its base had been divided with a tenotomy knife. The dura was sutured over the bare area of the bone and the cord replaced. The posterior opening in the dura was now completely closed and the wound sutured without drainage.

He made favourable progress and two months later, when transferred back to the medical side, was able to walk alone. The movements of the legs were much less spastic on the left side and much less ataxic on both sides. The pathological report showed a calcified, centrally necrosed chondroma of the body of the vertebra.

Sub-pial Endothelioma.

The fourth case is one of sub-pial endothelioma of the cord.

CASE 4.—Patient, aged 36, was quite well until September, 1916, when he had an attack of influenza. This was associated with pain in the back and the left side of the abdomen at the level of the umbilicus. After the attack he started work for a few days, but noticed that on crossing the road he always kicked the curb with his left foot and was unable to lift his toes up. At the same time he commenced to experience difficulty with micturition, chiefly in starting the flow. There was no retention and no incontinence. In December, 1916, he had a second attack of influenza, after which his left leg was weaker, so that he had to swing it on walking, but he could still manage to walk about four miles. The trouble with the urine increased, and in March, 1917, he noticed that the right leg felt numb below the knee. He was admitted to hospital on May 5th.

It was found that in his left leg the quadriceps and hamstrings were much weaker than on the right side and the anterior tibial group of muscles could not be contracted at all. There was no weakness in the arms or right leg. On the right side the knee-jerk was greater than on the left, and on this side ankle clonus was just obtained. On scratching the left sole the toe went up and there was a contraction of the left quadriceps and hamstrings. On the right side the toes were up, but the reflex was limited to the foot. The abdominal reflexes were not obtained.

On the sensory side there was no loss anywhere to cotton-wool. Sensation to pin-prick, to heat and to cold, were completely lost over the whole of the right leg and trunk up to the level of the third dorsal segment. On the left side there was loss to the same forms of sensation on the lower leg. (*Vide* Fig. 3.)

Operation was performed on May 16th.

The spines of D 1–8 were exposed in the usual manner and removed. The lamina of D 6 was trephined and those of D 5, 4, 3, and 2 removed with forceps. The dura was a little distended and there was only slight pulsation. On opening the dura no lesion could be seen, but pulsation did not return. The laminæ of D 1 and C 7 were therefore removed. As soon as the latter was cut pulsation returned, and at this spot the cord appeared widened. It was gently lifted with a slip of the dentate ligament, and a translucent mass was then seen apparently projecting from the lateral columns on the left side. On carefully incising the pia over the tumour it was seen to be extramedullary and by gentle dissection could be entirely freed. It lay between the left roots of C 7 and D 1, being embraced by these roots in its upper and lower extremities. The dura was closed entirely and the wound sutured without drainage.

Two days later the power of flexion of the left toes and ankle had returned. On May 22nd the wound was healing well. He had now the power of voluntary contraction of the extensors of the left foot and toes. The plantar reflexes were both down. On the 26th the wound was healed and all movements of the legs and feet were perfect. On June 14th he was walking perfectly and only felt slight weakness in the left ankle. There was slight dulling to pin-prick in the right leg but he could feel it all over. There was no hyperæsthesia and no urinary symptoms. Allowed home.

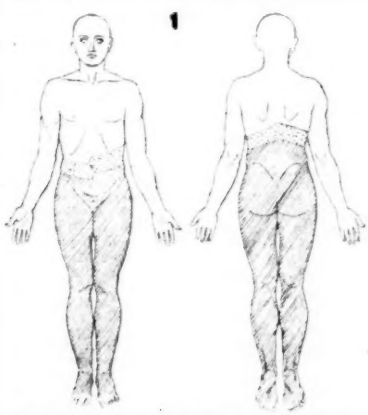

FIG. 1.—CASE 2. Shaded area, loss to pain, heat, and cold. Light touch lost, but upper level of loss 2 in. lower down. Vibration loss up to ninth dorsal segment. Dotted area, band of hyperæsthesia.

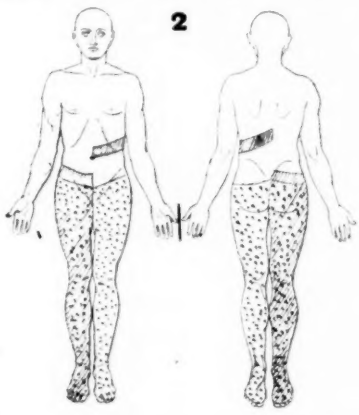

FIG. 2.—CASE 3. Dotted area, loss to vibration; shaded area, loss to prick, heat, and cold.

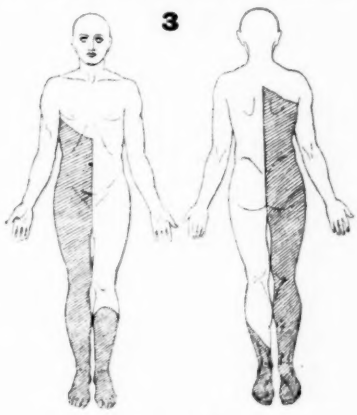

FIG. 3.—CASE 4. Shaded area, loss to prick, heat, and cold.

Complete Division of the Spinal Cord.

The next case is one of gunshot wound with complete division of the spinal cord.

CASE 5.*—Patient, aged 26, while passing through the German barrage on August 6th, 1916, was hit in the back by a shrapnel bullet. He fell at once with no pain, but with the feeling that the body below the middle of the chest had gone. There was no difficulty in breathing. He was carried back by stages to the C.C.S. In the first part of the journey he was semi-unconscious but later had a good deal of pain in the back. From the C.C.S. he was taken to Cannes where he was X rayed. The bullet was seen in the mid-line at the level of the sixth dorsal vertebra. His bladder had to be emptied night and morning with a catheter, and whilst here his lower limbs were flaccid and powerless. On August 16th he was admitted to the Empire Hospital.

On admission there was a small clean wound of entry to the right of the spine of the second dorsal vertebra. It was nearly healed. There was a large deep bedsore over the upper part of the sacrum. All

* This case was reported in full by Captain Riddoch, from whose notes my own were in large part abstracted.

muscles of the trunk below the sixth rib and of the legs showed total flaccid paralysis but there was no wasting. There were no involuntary movements of the legs. At the level of the fourth interspace there was a narrow band of hyperæsthesia. Vibration was lost up to the level of the ninth rib and all other forms of sensation up to the level of the sixth rib.

On August 28th, for the first time, on scratching the soles of the feet, upward movement of the toes was noticed and at the same time tightening of the hamstring tendons could be felt with contraction of the anterior tibial group of muscles. The receptive field was limited to the soles of the feet. On the 31st there were periodic involuntary upgoing toe movements, with tightening of the tibialis anticus and hamstring tendons. On briskly tapping the right patellar tendon there was contraction of the quadriceps, which was, however, insufficient to move the leg. On scratching the sole there were fairly brisk upgoing toe movements, with contraction of the flexors of the knee and hip and of the adductors of the thigh. The reflexogenous area extended from the sole to rather above the middle of the calf.

On Sept. 6th the involuntary contractions were sufficient to cause slight flexion at hip and knee, dorsiflexion at the ankle, and upward movement of the toes. The receptive area for the flexion reflex had extended from the centre of the calf to the groin, and was at times associated with contraction of the ipsilateral rectus abdominis. There was periodic contraction and emptying of the bladder.

Operation was performed on Sept. 8th.

The spines of D 4, 5, and 6 were removed with forceps and the corresponding laminæ thin excised. Opposite the bodies of the fourth and fifth dorsal vertebræ the cord was found completely divided, the ends being separated by about an inch. The shrapnel bullet was embedded in the body of the sixth dorsal vertebra and was easily removed. The wound was closed in the usual way.

On Sept. 20th the wound had healed well. There were strong involuntary flexor spasms of both lower limbs recurring at frequent intervals. The limbs were both flexed at the same time, and the extension which followed the spasms was purely passive and due to gravity. There was distinct tone of the physiological flexors, but the extensors were undoubtedly flabby. On tapping the patellar ligament there was contraction of the extensors, but no movement of the knee. A stimulus applied to the sole was followed by flexion of all the joints of the ipsilateral leg. There was no return of sensation.

On Oct. 26th the flexor spasms had become very frequent, and the abdominal recti were more involved. The knee-jerks were increased and equal with good extension of the leg at the knee. The plantar reflexes were "extensor" as before, and were always associated with general flexion reflex of the lower limb. The limbs never flexed together.

On Nov. 4th the reflex spasms were more frequent, and the involuntary movement consisted of flexion at the hip, adduction of the thigh, flexion of the knee, dorsiflexion at the ankle and upgoing toes, with fanning of the four outer toes. Usually there was an accompanying contraction of the quadriceps cruris and calf muscles of the opposite leg. The ipsilateral rectus abdominis participated more often in the flexor spasm. The flexion reflexes were easily obtained. The knee jerks and ankle-jerks were brisk and equal, and definite ankle clonus was obtained on both sides.

After this date the condition persisted without much change, excepting that during and after an attack of pyelitis all the reflexes were decreased, the flexion reflex was obtained with difficulty, and the reflexogenous area was greatly decreased. As the effect of the infection passed off the reflexes were obtained more readily and the involuntary spasm increased.

Partial Division of Spinal Cord.

The last case is one of gunshot wound, with partial division of the spinal cord.

CASE 6.—Patient, aged 21, was with a working party behind the support lines on June 8th, 1918. He was picking up some sticks when he suddenly fell down with a tingling feeling in his legs, but he felt no blow or wound. On attempting to rise he found that he had lost all power in his legs. He did not lose consciousness. He was taken back to the dressing station and then to the stationary hospital. There he was found to have a wound in the upper dorsal region, with complete paralysis and loss of sensation below. He had to be catheterised. On June 12th a laminectomy was performed and a portion of the lamina of the third dorsal vertebra found depressed on the cord. It was removed. The dura was uninjured.

On June 18th he arrived at the 2nd London General Hospital with the wound healing well. There was then complete motor paralysis with flaccidity below the fourth dorsal segment and complete loss of all forms of sensation to the same level. There were no ankle-jerks, but the knee-jerks were just obtainable. When the sole was scratched there was dorsiflexion of the foot, flexion of the knee, and flexion of the hip on the abdomen.

On July 25th he lay in bed with the legs extended. There were a few slow contractions of the legs, and if the bedclothes were moved they were both flexed at the hip and knee and adducted. They could, however, be easily drawn down. The bladder had commenced to contract automatically, but there was still complete loss of voluntary power in the legs and complete loss to all forms of sensation up to the level of the nipple. If the legs were touched they were flexed at the hip and knee, but the flexion was slow and gradual, with no sharp and painful contraction. There was now a well-marked knee-jerk, with a sustained contraction of the extensors on both sides. Ankle clonus could be obtained and on dorsiflexing the foot there was a definite extensor thrust. On scratching the inner side of either sole the toes were sharply dorsiflexed, with flexion of the hip and knee and definite, but slight, extension of the opposite leg. The flexion reflex of the stimulated leg was immediately followed by a movement of extension at the knee. The receptive field was limited to the sole and ankle on either side and at no time was the reflex accompanied by any contraction of the abdominal muscles.

On August 22nd there was return of voluntary movement of flexion and extension of the toes on both sides, but no movement of the ankle, knee, or hip. With it there was some return of sensation, prick being present above Poupart's ligament and on the soles, but not on the legs. Cotton-wool was absent below the umbilicus. The plantar reflex was as before, but there was now more marked ankle clonus, and the knee-jerks were greatly increased.

Sept. 13th: The general condition was good.

The motor spasms were less the contractions being slower and more regular. Voluntary contraction was still limited to the toes of both feet. Sensation remained as before. On scratching the soles of the feet there was dorsiflexion of the toes with flexion of the ipsilateral knee. Both quadriceps and hamstrings contracted sharply, but there was no movement at the hip. The other leg did not contract. The reflexogenous area was limited to the sole and dorsum of the foot. Ankle clonus was readily obtained and the knee-jerks were greatly increased. The upper abdominals were just obtained. There was still urgency and he was unable to hold his urine or faces when he felt the desire.

On Jan. 27th, 1919, the general condition was very good and there was no pyrexia.

He was able to get about in a chair with the legs hanging down. He lay in bed with the legs extended. There were very few spasms and the legs could be handled without inducing them, but occasionally a marked flexor spasm was caused by a pin prick to the sole. There was then dorsiflexion of the toes, flexion of the knees and hips on both sides, but no contraction of the abdominal muscles. The tone of all muscles was good. There was voluntary contraction of the flexors and extensors of the toes and ankles. He could flex the knees and hips, but this induced some spasm so that he could not extend them again. They could, however, be easily extended by steady pressure. On scratching the inner side of the soles there was dorsiflexion of the toes, slight flexion of the knee and hip, and a powerful and visible contraction of the quadriceps and calf muscles. There was no contraction of the contra-lateral leg and no contraction of the abdominal muscles. The reflexogenous area was limited to the sole and outer side of the ankle.

Knee-jerks were much increased and ankle clonus was present on both sides. There was loss to prick, heat and cold over the left leg from the umbilicus downwards to the ankle, but it was present over the whole of the right leg and the left foot. Sensation to cotton-wool was still absent to the level of the umbilicus.

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LITERARY INTELLIGENCE.—Messrs. Cassell and Co., Ltd., announce the publication of "Elements of Surgical Diagnosis," by Sir Alfred Pearce Gould and Mr. Eric Pearce Gould. This is the fifth edition, revised, of a work which has for some time been out of print. It has now been brought up to date, and embodies the advances that have been made in the diagnosis of surgical affections in connexion with war surgery. Much new matter has been added. —Messrs. Sampson Low, Marston and Co., Ltd., are publishing a work on child life by Dr. Courtenay Dunn, entitled "The Natural History of the Child."

THE TREATMENT OF GUNSHOT WOUNDS.

REPORT ON ACRIFLAVINE USED AS A PASTE AND IN SOLUTION.

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I.—ACRIFLAVINE USED IN THE FORM OF A PASTE.

IN the course of our inquiries into the value of a solution of acriflavine in the treatment of septic gunshot wounds it occurred to one of us that if it were used in the form of a paste, on the analogy of the well-tried "bipp" paste introduced by Rutherford Morison, its effect might be as satisfactory, or even more so. A paste was made up of pulv. bismuthi subnit., 50 per cent.; paraffin, about 50 per cent.; acriflavine, 0·5 per cent. Three cases having shown signs of bismuth poisoning, we adopted the carbonate instead, when we could obtain it. We are now modifying the composition, thus: bismuth carbonate, 25 per cent.; paraffin, 75 per cent.; acriflavine, 0·5 per cent.

On the introduction of any new detail in wound treatment a word of caution is necessary. The principles of surgery—viz., never to allow discharge to accumulate and to maintain free drainage in all septic conditions—stand fast as ever. At the risk of being thought somewhat behind the times, we urge that it is not so much the particular method of wound treatment or the individual antiseptic used as the laborious and conscientious attention to detail which brings success. We would insist upon the regular bacteriological counts and cultures of organisms during the treatment of wounds, just as we insist upon the routine examination of all fractures by X rays.

Method of Using Flavine Paste.

We have found very great advantage from its use in 18 cases, especially in gunshot fractures, and in suppurating polyarthritis, as in the foot. Having established free drainage and removed any parts actually necrosed, we have irrigated the wound by an automatic flushing method with eusol for 48 hours to 5 days. Then, under an anæsthetic, any remaining necrosed tissues are carefully cut or scraped from the wound and it is then very thoroughly washed out with methylated spirit, or absolute alcohol, and packed with the flavine paste. In our cases relief from pain was usually very noticeable, and as a rule it is not necessary to dress them more than once a week.

Wounds treated in this way show a marked local improvement and in a comparatively short time take on all the appearances of a healthy aseptic wound. In some cases after three or four weekly dressings under an anæsthetic with rigorous aseptic precautions, the wound and the discharge have become sterile, even in severe septic bone and joint cases, and it is then allowed to heal up or is secondarily sutured. The general condition as a rule shows rapid improvement.

Illustrative Cases.

Space allows only of a brief summary of some of the cases treated with (*a*) eusol and acriflavine solution and acriflavine paste in succession; (*b*) with eusol and acriflavine paste; and (*c*) with acriflavine paste only.

Eusol and Acriflavine Solution, and Acriflavine Paste in Succession.

CASE 5.—Admitted Nov. 6th, 1917. G.S.W. thigh, knee, and shin; very extensive, reaching from 8 inches above knee to upper and middle thirds of tibia. Knee-joint had been laid open and patella turned over to inner side; sinuses in popliteal space and calf. Continuous irrigation with eusol. On Dec. 18th necrosed patella was removed. Bacteriological count Dec. 20th, *Staph.* and *Streptococci p. aur.* 36 in field: 22nd, 27; 28th, scanty, Gram - bacilli 12. On Dec. 23rd acriflavine solution used as dressing, after 24 hours irrigation with normal saline. On Dec. 29th thorough cleansing under $CHCl_3$ and free application to wounds, knee-joint, and sinuses of acriflavine solution on gauze. On Jan. 7th, 1918, wounds cleansed, spirit applied, and paste used. Bacteriological count Jan. 11th, 15. The paste was used as a dressing until he was transferred to England. On and after its introduction the improvement of the wound was very marked at first and then steadily continuous, especially as regards extensive anterior lesion, although sinuses continued to discharge. Sixteen bacteriological counts made between Jan 11th and March 1st gave an average of 8 per field.

This case was noteworthy on account of the severity of the lesion, the fact that the limb was ultimately saved, particularly by timely surgery and by the freedom from pain after dressing when the paste was used.

Gunshot Wounds Treated with Eusol Irrigation and Acriflavine Paste.

CASE 5.—Shrapnel wound lower extremity right ulna on Nov 6th, 1917. Admitted Nov. 13th. No F.B. Eusol irrigation till Dec. 13th, when acriflavine paste used. Bacteriological count steadily diminished from 15 on Dec. 13th to 1 in two fields on Jan. 8th; average of 10 counts, 4 per field. With the exception of extrusion of minute sequestra, the wound, dressed with the paste at intervals, did very well, and was healed on April 14th, 1918.

CASE 6.—G.W.S. right foot. Was admitted to General Hospital on Nov 19th, 1917. Chopart's amputation performed previously to admission; wound was freely suppurating; necrosis of astragalus and os calcis. Eusol was used; organisms in field remained uncountable for a month. The wound was then thoroughly scraped under an anæsthetic and treated with absolute alcohol and acriflavine paste. The organisms fell to 2 in three fields and were finally nil. Improvement was very marked; patient was discharged to England in three months with wound healed all but superficially.

CASE 8.—G.S.W. involving knee-joint. Admitted Dec. 20th, 1917. Joint laid freely open by turning down patellar flap. Was flushed with eusol until organisms in field were 2 in number; then a weekly dressing with acriflavine paste substituted until March 3rd 1918, when signs of stomatitis appeared, due to bismuth absorption. Weekly examinations of discharge from wound showed small numbers, varying from 2 to 10, of *Staph.* and *Streptococcus aureus*. The paste was stopped on March 3rd and boric acid substituted. The wounds ultimately healed.

CASE 12.—G.S.W. leg; admitted April 9th, 1918. Wound had been excised on east side of Suez Canal, "bipped" and stitched. When admitted suppurating freely. All stitches removed; mass of "bipp" and pus evacuated. Dressed by intermittent irrigation with eusol. On April 20th packed with flavine paste. On May 2nd symptoms of bismuth poisoning supervened; paste discontinued, and eusol substituted. While flavine paste was in use the wound made rapid progress, and was "clinically sterile" on discharge of patient to England.

CASE 13.—Patient was blown up when ship was torpedoed, and piece of metal driven into thigh. On admission wound was septic; it was repeatedly opened up; sinuses drained and counter openings made. Hip-joint became involved; head of bone was excised. Organisms 6 in field. Acriflavine paste was used; in 8 days bacteriologist reported sterile.

CASE 14.—G.S.W. and fracture of bones of foot. Admitted April 9th, 1918. Soft tissues around wound had been freely excised at C.C.S. and "bipped" on April 1st, 1918. Wounds were opened up, enlarged, "bipp" was removed, and *Staphylococcus aureus* found in pus. The foot improved steadily but slowly. On May 5th wound was cleaned, and acriflavine paste applied. From "organisms uncountable" to "wound clinically sterile" occupied 26 days. Patient discharged to England on June 20th, with merely surface dressing. All sinuses closing rapidly and no bare bone felt; good prospects of patient having a useful foot.

CASE 16.—Extensive G.S.W. thigh and leg, Nov. 7th, 1917. Admitted Nov. 10th; also suffered from malaria. Treated with eusol irrigation. F.B. removed and better drainage provided. Bacillary count 1, scanty, 3, 2, 2, 3, 3 *Staph. p. aureus* pure. On Jan. 29th tibia scraped and wound packed with acriflavine paste. Average count 2 per field in 15 counts. Acriflavine paste dressing continued. Healed by May 15th, 1918.

CASE 18.—G.S.W. right thigh on Nov. 25th, 1917. Admitted Dec. 3rd. Large discharging wound at inner aspect of lower third of thigh and comminution of femur. Discharge continued. On Feb. 13th, 1918, bacterial count was 27 *Staph. p. aureus* (pure) per field. On Feb. 14th amputation was discussed; but packing with acriflavine paste was done, after removal of necrosed bone. Subsequent counts, Feb. 22nd 2; March 8th. 5; 13th, 4; 27th, 3 per field. Pain had been a distressing feature in dressing, but none was felt after use of paste. The wound continued to do well, and it was evident that loss of limb had been averted. He was invalided to England almost healed.

Value of the Treatment.

Although the cases treated are only 18 in number and too few on which to dogmatise, yet we feel that the use of a paste of acriflavine is worthy of more extended trial. In itself we do not think that 0·5 per cent. of acriflavine had any toxic effect; and any symptoms of poisoning observed were undoubtedly produced by bismuth subnitrate—perhaps impure. Similar calamities were observed when, following the initiative of Beck, of Chicago, the bismuth treatment of tuberculous sinuses was practised, and doubtless poisoning occurs from time to time when the bismuth and iodoform paste is used.

Various surmises have been made as to the method by which pastes act. It is quite clear that a rigid technique must be adhered to and the wound thoroughly cleansed and rendered practically sterile clinically before they are employed. If these precautions are not taken the paste acts as a foreign body and has to be removed, as in two of our cases which were "bipped" at another hospital.

It is difficult without more experience to assert that acriflavine paste is superior to "bipp," but that it is efficient when properly employed we have reason to hope. And we would insist again upon this fact that the element of success is thorough cleansing of the wound, washing every nook and cranny with absolute alcohol, and then applying the paste. The facts that painful dressings are not required, that dressings need only be done occasionally, and that there is little or no pain after pasting as compared with packing sinuses with gauze soaked in other antiseptics are very significant. We have observed that under the

paste the granulations were small, equal, velvety, and formed rapidly under a covering of it. The skin edges were healthy and grew in rapidly. Also, that while gauze soaked in eusol adheres to the growing edge of the skin and damages it when removed and causes it to become thickened, the paste acts as a protective to the epithelium and renders dressing easy and painless. It may therefore be of use as a superficial protective dressing.

II.—THE USE OF ACRIFLAVINE SOLUTION IN DRESSING.

In carrying out these observations on acriflavine we endeavoured to do so systematically, and by the kindness of Colonel O'Sullivan, C.M.G., O.C., —— General Hospital, a ward containing 12 beds was placed at our disposal about 14 days after the capture of Gaza in the autumn of 1917, although on two occasions the exigencies of the service caused this scheme of observation to be interrupted for a short time.

Our first endeavour was to establish controls, and for this purpose three cases similar in nature and severity to the others were treated by one antiseptic—viz., eusol. After each dressing smears were taken and the number of organisms in the microscopic field counted. We used as definition "uncountable" when they were very abundant; in other instances we give the actual numbers in the field, and we speak of cases as being "clinically sterile" when there were not more than two or three in a field. When the discharge had arrived at the last-mentioned stage we deemed it time, if the wound was extensive or gaping, to lessen its size or close it by secondary suture.

Illustrative Cases.

The following are short accounts of some of the cases:—

Control Case Treated with Eusol Throughout.

CASE 1.—G.S.W. thigh on Nov. 5th, 1917. Admitted to General Hospital on Nov. 9th. Two small pieces of metal defined in tissues by X rays. Continued to discharge; on Jan. 4th, 1918, streptococci 5 per field. On Jan. 5th two sinuses opened up on back of thigh, foreign bodies removed, and drainage tubes inserted. The tissues lining the sinuses looked septic and were unhealthy. On Jan. 8th streptococci 3 per field; Jan. 10th streptococci and *Staphylococcus p. aureus* 2 per field; Jan. 12th and 15th 3 and 1 per field of staphylococci and streptococci respectively. Jan. 17 h: *Staphylococcus p. aureus* pure, 3 per field. Jan 21st, no pus; 25th wound sterile; Feb. 6th, wound healed completely. Applications throughout were eusol applied on plain sterile gauze.

Case Treated with Eusol for a Few Days and then with Acriflavine Solution 1 in 1000.

CASE 1.—G.S.W. left foot on Nov. 6th, 1917. Admitted to General Hospital on Nov. 13th. Dressed with eusol until Nov. 27th; then eusol discontinued, and irrigation with sterile normal saline solution for two days. On Nov. 15th *Strepto-* and *Staphylococcus p. aureus*, 23 in field after the case had been dressed with eusol. After two days of acriflavine treatment 37 in field, and in three days 13. The further records are: Dec. 2nd, 3; 3rd, 3; 4th, 4 (streptococci only); 5th, 2 (strepto- and staphylococci; and so on day by day until, on Dec. 16th, the wound was completely sterile, and shortly after it was soundly healed. Surgical measures, such as removal of necrosed bone and ample drainage, were accomplished on Dec. 5th.

In two cases of diphtheroid infection of wounds treatment with acriflavine solution was ineffective.

CASE 4.—Whitlow of thumb, secondary abscess middle and upper arm. Admitted Dec. 19th, 1917, with sloughing discharging whitlow of thumb, and a very dirty ulcer over biceps 3 inches diameter. Its floor was composed of disintegrating sloughing necrotic tissue, in some parts very dark, edges and walls much undermined, and surrounding tissues showed inflammatory reaction. Diphtheroid super-infection suspected on Dec. 21st. On this date streptococci 30 in field; 23rd, 34; 26 h. 34; 28th, 14. Jan. 1st, 1918: streptococci, staphylococci, and Gram-bacilli uncountable. Treatment: Incision, curetting, constant irrigation with eusol, and injection of hydrogen peroxide around lesions. Extension of ulcer on arm less rapid on Dec. 23th, but was intermittent for more than a fortnight. On Jan. 6th was given 6000 units anti-diphtheritic serum, and 4000 units on the 9th. Extension of arm ulcer resumed on Jan. 13th. Acriflavine injections 1 in 2000 just beneath extending edge, and surface dressed with 1 in 1000 solution and injection repeated on Jan. 15th. Bacteriological count before acriflavine used 15 per field. Afterwards on Jan 15th 16; 17th, 20; 19 h, 32; 23rd, 21. On Jan. 19th the following were present: streptococci, Gram -, Gram+ staphylococci, and diphtheroids. On Jan. 22nd was given 6000 units antidiphtheritic serum. On three occasions between Jan. 25th and Feb. 2nd the wound was well scrubbed with anti-diphtheritic serum. On Feb. 2nd a swab was reported as negative, and again on Feb. 6th, when the lesions had a healthy appearance.

Results of the Treatment.

We are unable to affirm that gauze soaked in acriflavine solution when applied as a dressing to wounds presents any outstanding advantages, and it does not exhibit any marked superiority to eusol. In fact, so far as the effects of acriflavine solution on granulations are concerned, these often become sluggish and indolent. Every effort was made to keep our technique sound throughout in spite of numerous difficulties, and we were generally successful. Acriflavine entails the use of rubber gloves, for the solution was found to provoke an acute eczematous condition when it came in contact with the unprotected skin of the hands. Preparations of flavine have another drawback, they have such an intense staining power.

Those things which seemed to us to have far more influence than any antiseptic on the progress of the wounds were evacuation of foreign bodies and of sequestrums, thorough mechanical cleansing, free drainage, and the most scrupulous care in the technique of wound dressing. And so far as concerns the information afforded by the above observations, scanty though it is by reason of the small number of the cases, yet involving laborious bacteriological investigations and counts, we fail to see that acriflavine solution is superior to all others yet introduced in combating bacterial growth in wounds or in promoting rapid healing. It was certainly powerless in the presence of diphtheroid bacilli, and not eminently satisfactory in that of *Strepto-* and *Staphylococcus p. aureus*. It is far less useful than the paste.

A TREATMENT FOR TRENCH FEVER.

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THE following paper is presented with a full knowledge of the fact that the method of approach is not purely scientific and is open to criticism from many an angle. The difficulties of diagnosis, the uncertainty of establishing a cure, the specific effect of any treatment,—all depend on the demonstration of the causative agent. Furthermore, the scientific attack upon disease is prophylaxis, and the way to prevent trench fever is, in theory, perfectly simple—to get rid of lice. This will probably be most thoroughly accomplished when the preventive treatment of war wounds has been put into force.

The following results are also presented with a full knowledge of the fact that there is absolutely no treatment for the disease; even the mainstay of the practitioner, symptomatic treatment, yields most unsatisfying results. References to wastage of man power are not necessary.

Treatment by Intravenous Injection of Collargol.

In the Medical Supplement (compiled by the Medical Research Committee) of the "Daily Review of the Foreign Press," issued by the General Staff, War Office, dated Feb. 1st, 1918, p. 28, is found the following:—

"According to Richter[1] intravenous injection of collargol (10 c.cm. of 1 per cent. solution is a specific remedy comparable to quinine in malaria. Three injections at two- or three-day intervals cure acute cases."

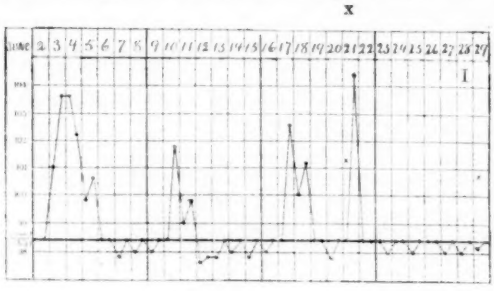
Even though we were fully aware of the history of this drug and of the fact that it, with other colloidal preparations, has not done all that enthusiasts have claimed, and even though we were aware that certain other silver preparations have been tried in trench fever to no avail, it seemed to us that a trial of collargol was worth while for two reasons—the drug differs considerably from other colloid silvers and there is no great evidence of particular worry about trench fever in the enemy literature.

We present our results even though the number of cases is relatively small—the total is 35 cases—because of the uniformity of the results obtained; 100 per cent. of 35 cases is somewhat better than 35 per cent. of 100 cases. The number is certainly too small to substantiate Richter's claim for specificity; such a claim cannot be decided until after general trial, and it is with the hope that this treatment may be tried out by other workers, and with the assurance that it at least gives us something to do, that we offer the results for what time may show them to be worth. There has been no question in the minds of the clinicians who have followed these cases that the collargol was immediately followed by marked improvement and recovery; it has only been difficult to decide in some cases whether the collargol was merely an incident in the course of the spontaneous recovery from the disease. Some cases do so recover, though

[1] Richter, E.: Therapie d. Gegenwart, 1917, N.F. 19, 89-95.

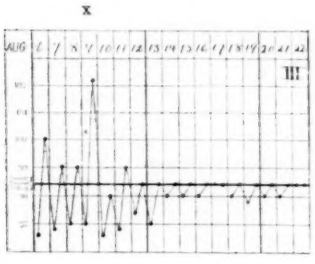
of the cases reaching the base by no means the 90 per cent. reported by the British Trench Fever Committee. We have learned of no method of distinguishing between a case which will spontaneously recover, and one which will spend the next six months in hospital.

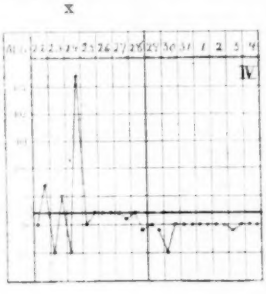
It will be noted that a pronounced reaction follows the intravenous injection of 10 c.cm. of a 1 per cent. solution of



collargol, made in sterile distilled water, and it is of interest that the patients often compare this reaction to their initial attack. We are not disposed to consider this reaction as a harmful effect. The only untoward symptom will develop if the injection does not enter the vein but passes into the cellular tissue. If this occurs a decided inflammatory reaction may follow, even leading to abscess formation.

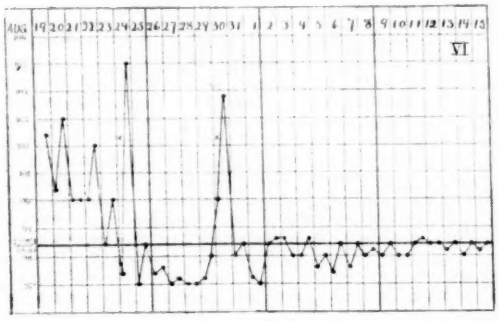
We are under lasting obligation to the American Red Cross for a small supply of the collargol of recent manufacture.



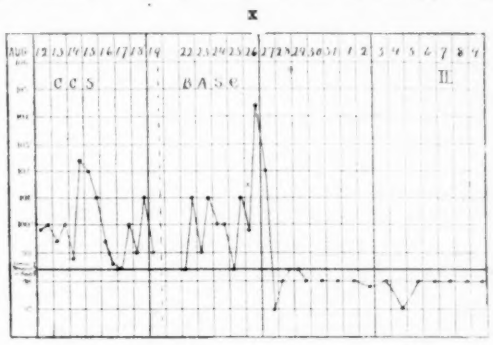


Illustrative Cases.

We have chosen the accompanying 7 of our 35 charts to illustrate certain points. The time of the injection of the collargol is indicated by an x. It will be noted that we have not always carried out the injection at two- or three-day intervals. In some we have done this, and the reaction seems generally to be much less marked when the second injection follows the first after a short interval (No. 5). We

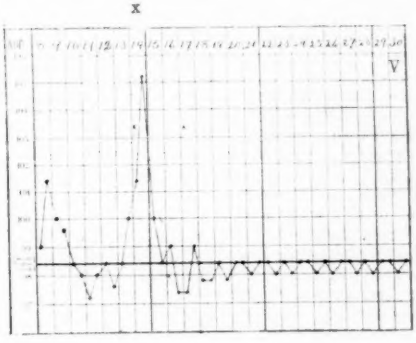


purposely did not carry out the two- or three-day injections in many cases, for it seemed a way to control the question of whether we were dealing in coincidence. Nos. 1 and 2 are somewhat difficult to explain on the theory of coincidence; Nos. 3 and 4 may possibly be so explained, as well as, perhaps, No. 5. But if the effect of the first injection in Nos. 6 and 7 is to be explained by coincidence, then the effect of the second injection, when the fever and pain had returned after a six-day interval, makes the theory of coincidence appear like an excellent treatment. Nos. 6 and 7 were followed for three weeks after the second injection—



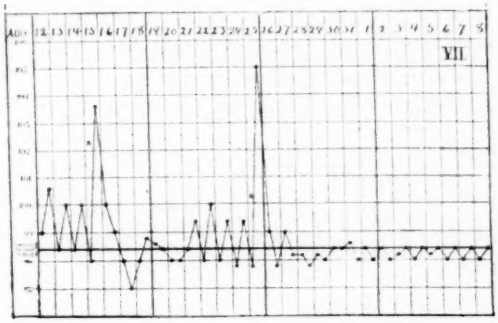
a week more than is charted—with no return of symptoms of any kind.

No. 1.—Captain A, U.S.M.C. Attack began Feb. 6th 1918; course marked by fever, recurring every seventh day, preceded by chills and accompanied by backache, headache, and shin pain. Lost about 20 lb. in weight. June 21st, 10 c.cm. collargol. Has had no return of symptoms since, and has regained the lost weight. Has been under observation for 15 weeks since the collargol.



No. 2.—Private S. Entered hospital bringing chart for August 12th to 19th. August 26th, collargol. Temperature fell to subnormal the next day, rose to normal August 28th, and remained normal until discharge, Sept. 11th.

No. 3.—Private H. Admitted August 5th, 1918. Patient says he has had chills and sweats, pain in head, back, and shins, for five weeks, and has the same sort of attack 14 months ago. Collargol August 9th. Observed until 22nd with no return of fever or typical pain. Discharged



charged complaining of weakness and stiffness and pain in knee and wrist-joints.

No. 4.—Private H. Admitted to C.C.S. August 13th, 1918, complaining of headache, backache, pain in shins, and chills and fever. Admitted to hospital on 22nd. 24th collargol. 28th out of bed, no discomfort. Observed to Sept. 4th; no complaints except feeling weak.

No. 5.—Private S. Attack began August 4th. Fever, chills, pain in head, back, and shins, perspired easily. Fever evidently of the six-day

intermittent type. Collargol August 14th, following fever spike. Second injection on 17th with no reaction. Observed to 31st; no return of fever or pain.

No. 6.—Private E. Admitted C.C.S. August 19th, 1918, to hospital on 22nd. Collargol on 24th. Return of fever and pain six days later; second injection collargol. Discharged Sept. 24th.

No. 7.—Bugler J. Admitted August 12th, 1918, with usual symptoms and extreme tenderness of shins. Said he had similar attack in July, 1916, was three months in hospital and convalescent camp. In July, 1917 second attack, spent 31 weeks in hospital, convalescent and training camps. Says present attack is more severe than either previous attacks. On August 15th collargol. Six days later fever and pain recur; second collargol on 25th. 28th out of bed, no aches or pains. Discharged Sept. 17th, with no aches or pains and gaining weight.

ADHESIONS OF THE SIGMOID

ASSOCIATED WITH CONGENITAL ABNORMALITY OF THE MESENTERY CAUSING CONSTIPATION.

BY J. P. LOCKHART-MUMMERY, F.R.C.S. ENG.,

SENIOR SURGEON TO ST. MARK'S HOSPITAL FOR DISEASES OF THE RECTUM AND TO THE QUEEN'S HOSPITAL FOR CHILDREN;

AND

DRURY PENNINGTON, M.B., B.C. CANTAB.

IN a paper read before the Royal Society of Medicine [1] one of us (J. P. L.-M) described a number of cases somewhat similar to the following. Cases have also been described by numerous other surgeons, and particularly by the late Dr. Tuttle, of New York, who recorded an almost identical case. We feel convinced that many cases of severe constipation or auto-intoxication are due to abnormalities of the sigmoid associated with membranous adhesions of congenital origin. These membranous adhesions are found in different parts of the colon but most frequently in the sigmoid and cæcal angles. A similar condition of the ascending colon is sometimes described as Jackson's membrane. These adhesions are quite common and must not always be regarded as pathological, for it is only in a few cases that any symptoms arise as the result of their presence. A significant fact, however, is that they are frequently present in cases of malignant disease of the rectum and pelvic colon. Whether they are a predisposing cause of malignant disease in this part of the intestine we cannot say.

Cases associated with a definite congenital abnormality of the mesentery are of particular interest in view of the fact that Professor Keith has put forward the theory, which we believe to be the correct one, that these so-called adhesions, or membranes, which are often associated with the large intestine, are congenital in origin. We do not think it is correct to attribute them to previous inflammatory conditions, since, as a rule, no history of any previous mischief in the abdomen can be discovered. They are not true fibrous adhesions, but folds or adventitious membranes forming part of the normal peritoneum, and formed at the time when the large bowel was being differentiated from the small intestine.

Notes of Case.

The patient was a domestic servant, aged 32, who consulted one of us (Dr. Drury Pennington). She complained that for the last three years she had been suffering from severe constipation associated with pain over the left iliac region. She was unable to get any action of the bowels except at quite irregular intervals, even with the use of drastic purgatives. She had lost health during the last year and found it very difficult to carry out her duties. Two years before she had had all her teeth removed. One wonders on what possible reasoning doctors can advise such mutilation; it would be as reasonable to cut off a patient's ears for sciatica!

On examination nothing could be felt in the abdomen, which appeared to be normal. There was some slight tenderness in the left side. Examination per rectum revealed nothing abnormal, but an examination with the sigmoidoscope showed very definite adhesions fixing the lower part of the sigmoid towards the left iliac fossa. Vaginal examination showed tenderness in the left fornix which suggested ovarian mischief. Examination of the urine was negative. We came to the conclusion that the proper course was to open the abdomen and investigate the condition. The patient was therefore admitted to St. Mark's Hospital, where she was operated upon by Mr. Lockhart-Mummery.

[1] Trans. of the Surgical Section, vol. v., p. 191.

On opening the abdomen a very curious condition was found. The sigmoid, which was very long, was curved on itself so as to form a long loop which passed down towards the back of the pelvis on the right side, where it was firmly fixed by dense adhesions to the posterior abdominal wall and to the extremity of the small gut. There were no adhesions to the appendix. The two sides of this loop were also firmly adherent together. There was a curious abnormality of the mesentery, as the mesentery of the small intestine came across the descending colon so that this part of the colon appeared to emerge through a tunnel in the mesentery. The appearances are shown in the illustration.

A, Loop of sigmoid. B, Tunnel under mesentery into which descending colon disappeared. C, Membrane binding together the two limbs of the sigmoid loop and tying it to the termination of the ileum. D, Bands tying end of loop to posterior pelvic peritoneum.

The loop was first detached from its attachment to the pelvic wall by carefully dissecting off the adhesions, and then the two limbs were separated by dissecting away the membrane which attached them. It was now found that the loop was free to move about in the abdomen, and the sigmoid assumed more or less its normal appearance. It was not considered necessary to perform an anastomosis, but all raw areas left uncovered by peritoneum were very carefully sutured with fine thread.

The patient made an uninterrupted recovery from the operation, with the exception that she had a small hæmatoma under the skin. Since the operation the patient's bowels have acted in a normal manner, and she has had no further trouble from constipation. A year after the operation she was in good health and her bowels acted regularly without the aid of aperients.

A PROBLEM IN THE TREATMENT OF WHOOPING-COUGH CASES.

BY N. MACLEOD, M.D. EDIN.

THE problem may be formulated in the query, Can these cases be treated satisfactorily without drugs? The results of over 40 years' experience in such cases, the writer thinks, go far to justify a reply in the affirmative.

Treatment by Brushing Throat with Resorcin Solution.

IN THE LANCET in 1836 [1] Dr. W. H. Barlow reported the successful treatment of 50 cases of whooping-cough by brushing the throat with a resorcin solution. Shortly after the above date a lady with her four children, one of whom had whooping-cough, was about to leave Shanghai for home and the writer's aid was enlisted. The lady was told that the above method seemed worthy of trial. The mother's report was that the paroxysms of coughing had been quickly lessened in frequency and severity, that two of her other children had developed a paroxysmal cough without whoop and, as directed, had had their throats brushed from the time that the cough began. Meantime a trial of the resorcin throat-brushing in the writer's practice met with marked success in certain cases. Failure was early attributed to the directions not being thoroughly carried out, and steps were taken to secure proper execution. The test of success was a reduction of severity and frequency in the night paroxysms within a week. This reduction was usually noticeable when toleration of the brush was markedly set up in the pharynx.

With whooping-cough cases success became so marked that no other mode of treatment or drug was used by the writer from the late "nineties" to his retirement from general practice in 1913. No further opportunity occurred for testing a later suspicion, confirmed by perusal of notes consigned to an indexed portfolio when observations were

[1] THE LANCET, 1888 i. 966.

made, but overlooked until a case with severe paroxysms seen last year in consultation recalled both notes and suspicion. The latter—viz., that the drug resorcin had probably little, if anything, to do with the success of the mode of treatment, was further strengthened recently by reference to Whitla's "Dictionary of Treatment," where resorcin and some seventy odd drugs and modes of their use are said to be employed in the treatment of whooping-cough. From this it may safely be inferred that no one of them is generally regarded as pre-eminently successful.

Without the sedative and anti-epileptic effects claimed for resorcin, how could success be accounted for? Though the following considerations presented themselves while treatment was going on, until they were arrayed together lately their force did not appear manifest. The throat-brushing procedure is accompanied by physical and physiological results independent of the drug. Are they in themselves sufficient to account for success? They are:

1. Physical. It was very early noted that after most applications examination of the brush disclosed more or less mucus. When it is realised that the brush is used hourly during the waking period, and also that the cough frequency and violence are in all probability not so much due to the quantity of mucus, usually not large, but to its particularly tough and sticky character, it is manifest that its removal by brush lessens the need for removal by cough.

2. Physiological. The frequency and violence of the cough paroxysms and laryngeal spasm indicate increased irritability of the reflex nervous mechanism concerned. There is also inadequate inhibitory control manifested by the difficulty in getting patients to restrain or repress the cough. In the course of the disease the reflex is exercised more than the inhibitory mechanism. Inhibitory power is materially reinforced by hourly obedience to the order to open the mouth widely and stick out the tongue during forced respiratory effort, and continuing all three efforts while a brush is being even only once turned round in the pharynx, and, as not infrequently happens, in the larynx itself. Pharyngeal and laryngeal tolerance of the brush demonstrates lessened irritability of the sensory and motor halves of reflex cough and spasm mechanisms in the presence of a foreign body, and contributes to better exercise of inhibitory action in such circumstances.

Psychological effects accruing from the discipline are also involved in the hourly performance, and, even on the part of the youngest patients, satisfaction and pride in successful coöperative effort.

Description of Method.

The writer is greatly mistaken indeed if those handling whooping-cough cases may not be confidently assured of attainment of the results here set forth when the procedure recommended is carried out thoroughly—viz., such amelioration within a week or ten days of starting brushing in cases where paroxysms and spasms are violent and frequent that the disease ceases to cause distress to the patient and anxiety to the parent, and, when applied early in suspicious cases, prevention of development of distressing cough and spasm.

Material.—For each case a wire-handled throat brush, bent at first suitably for pharyngeal use; when tolerance there is established it should be further bent to form almost a right angle about 1½ inches from its point, proximal and distal parts being straight, for laryngeal brushing—quite practicable without artificial light and mirrors; a 2 per cent. solution of resorcin in glycerine and water, 1 and 12 parts respectively.

It may be noted that when tracheal injections came into vogue for tubercular lung trouble the writer soon discarded the use of artificial light and mirrors on finding that he could introduce the syringe point into the larynx and inject the menthol solution whilst the same precautions were carried out by the patient as when the brush was used. This new mode of procedure was preferred, success and failure in entering the larynx being also distinguished, by the patient.

Procedure.—Immediately before each early application of the brush it is well to put the patient through a preliminary drill in breathing deeply with the mouth wide open and the tongue well protruded, to be persisted in while the brush is introduced into and passed quickly once round the walls of the pharynx. Mucus should be washed off on withdrawal and the brush kept in a tablespoonful of the resorcin solution—renewed daily—to be ready for the next performance an hour later, the procedure being repeated regularly during the waking period. In cases shy of the brushing it is helpful at the first performance or two to be satisfied with brush introduction short of the pharynx, so that the tongue, &c., contact becomes tolerated sufficiently, and the sweet taste of the solution experienced, repeated say three or four times on each occasion. Gradually introduced further the brush soon reaches the pharynx, where a single turn round its walls will suffice. The attempt to enter the larynx should not be made until brush toleration is set up in the pharynx. An exhibition of successful performance by another patient—younger if possible—is a good preliminary to beginning operatio with new ones.

Perhaps someone already using this method of treatment, or adopting it, will be good enough to test and report whether resorcin is essential to its success.

Shanghai.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF

ACUTE ERYTHEMA RESEMBLING MEASLES.

BY F. H. KELLY, M.B., B.S. LOND.

CASES of acute erythema simulating scarlet fever have been described not infrequently, and a certain diagnosis may be wellnigh impossible. Cases in which measles is the disease simulated are less common, and diagnosis usually comparatively simple. The case to be described is of interest both on account of the intensity of the eruption, and also because in the early stages the resemblance to measles was more than usually close.

The patient was a healthy boy of 13 at a large public school. He had had four attacks of urticaria for which no cause had been found, and also measles. There was no infectious disease except influenza during the term in question. In the middle of term he was found to have a rash. He had felt perfectly well previously and did not feel ill. Temperature 100° F. The rash consisted of large discrete papules with a well defined edge about ¼ inch in diameter, confined to upper part of front of chest. One small gland in posterior of neck; occipital glands not palpable. Marked, though not intense, conjunctivitis of both eyes, about as intense as seen at commencement of measles. Thin layer of whitish fur on tongue; papillæ not enlarged; slight inflammation of fauces. No Koplik spots.

Next day the rash had spread rapidly and coalesced, covering whole body, except scalp, palms of hands, or soles of feet; circumoral region completely covered. The rash, brick-red on the trunk owing to underlying pigmentation, was a vivid scarlet on the face and limbs, and was especially bright on the legs. Considerable œdema of skin generally; no hæmorrhages in skin. A large bulla had formed on the neck, discharging watery fluid. Eyelids stuck together by exudate in morning. Lips cracked and sore. The tongue was as on previous day, except for an elongated blister ¼ inch long. There was now intense inflammation of the mucous membrane of the mouth and pharynx, most marked in five or six places on inside of cheeks; on these places small vesicles, up to ¼ inch across, had formed. But for the larger vesicles the smaller might easily have been mistaken for Koplik spots. The inflammation of the throat was fairly uniform. Temperature 102°.

On the third day the intensity of the rash was still greater; œdema of skin so marked as to cause great stiffness of limbs; joints and muscles unaffected. The face was quite unrecognisable, being very similar to a severe case of dermatitis venenata. Around the neck and on the limbs numerous bullæ had appeared, not at all tense, and in most discharging contents freely. A few small subcutaneous hæmorrhages on the trunk. The lips were cracked, and bled profusely on the slightest touch. The vesicles in the mouth had spread, and in some cases burst.

No marked change for some days. The bullæ increased in size, one over right patella 5 in. long. Any part subject to friction or pressure became sore owing to bullæ which burst, but the sacral region, where the rash was not so intense, did not become sore. The formation of bullæ passed imperceptibly into desquamation, and also in places where bullæ had not formed, such as anterior surface of trunk; the epidermis when it separated revealed a dry surface underneath. In places it was hard to say whether the desquamation had been preceded by bullous formation or not. Approximately desquamation may be said to have commenced at least as early as the fourteenth day, occurring while the rash was still well out, although œdema of skin had lessened a good deal. The whole surface desquamated,

including scalp, palms of hands, and soles of feet, mostly in large sheets, some several inches in diameter. The skin of the palmar surfaces of the hands and plantar surfaces of the feet separated in practically entire sheets at about end of third week. There was considerable pigmentation of the skin after desquamation was complete and the colour had faded, especially marked on lower abdomen. The skin of the limbs, and especially of the legs, remained rather a mottled purple colour. Desquamation was complete in five weeks.

The great trouble was the intense discomfort caused by the condition of the lips and interior of the mouth. The temperature, never above 102°, fell to normal on the eleventh day. Throughout the patient never appeared particularly ill. He had no vomiting or diarrhœa and at no time any cough or nasal catarrh. No special treatment was adopted except local remedies to keep the various lesions clean.

No cause was found for the eruption. The patient did not seem to have eaten anything unusual or anything which he had not eaten many times before. He could not remember if he had eaten anything which he had also eaten preceding one of his attacks of urticaria.

Hurstpierpoint, Sussex.

REPORT ON THE USE OF FORMALIN SPRAY IN CHECKING INFLUENZA AT THE GERMAN PRISONERS OF WAR CAMP, ISLEWORTH.

BY ANGUS WYLIE, M.B., B.C. CAMB., M.R.C.S., L.R.C.P., CAPTAIN, R.A.M.C.; M.O. I/C TROOPS.

IN the recent epidemic of influenza among the troops at No. 1 centre, The College, Isleworth, and among the Q.M.A.A.C. of the Hounslow, Osterley, and Isleworth area, I found that the spraying of all billets, mess rooms, and canteens by a fatigue party of eight men under the charge of a non-commissioned officer appeared to be followed by an immediate check in the spread of the epidemic.

At a later date, Nov. 4th, a severe outbreak of the epidemic occurred among the prisoners of war billeted in the rooms of a house at Isleworth, in which I had an opportunity of testing this simple method of combating the disease. The sprays, three in number, which were used twice daily from the second day of the epidemic, were Heppel's hand fly sprays with a capacity of 1¾ pints of fluid in each. Each spray was charged with 6 drachms of 40 per cent. formaldehyde to 1¾ pints of water, making approximately a solution and vapour of 1 per cent. formalin.

The table shows the daily strength of the prisoners, the daily number of cases of pyrexia, fresh cases, and their disposal. After the removal of the first batch of 15 cases to hospital on the second day of the epidemic no further cases were removed to hospital until the fifth day, owing to shortage of hospital accommodation. Some of these cases in the billet were severe, but all recovered.

Table of Cases.

Date.	Day of epidemic.	Strength.	No. of cases of pyrexia.	Fresh cases.	Disposal.
Nov. 4	First.	56	3	Nil.	Kept in billet.
,, 5	Second.	56	15	12	15 cases removed to hospital.
,, 6	Third.	41	20	20	Kept in billet.
,, 7	Fourth.	41	6	Nil.	,, ,,
,, 8	Fifth.	41	3	1	3 cases removed to hospital.
,, 9	Sixth.	38	1	1	Kept in billet.
,, 10	Seventh.	38	2	1	,,
,, 11	Eighth.	38	1	Nil.	,, ,,
,, 12	Ninth.	38	Nil.	Nil.	

Of the 56 prisoners 18 had a normal temperature throughout. Two days after the spraying was commenced, on Nov. 5th, the fresh infections dropped from 20 to nil and the epidemic appeared to be suddenly deprived of its strongly infectious character, although single fresh cases occurred until the eighth day of the epidemic. These results confirmed my impression that the method had been effective in dealing with the previous outbreak at the College and among the Q.M.A.A.C., and are interesting enough to justify me in specially bringing them to notice.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

Discussion on Shock.

AT a general meeting of Fellows of this society, held on Jan. 23rd, a discussion on Shock was opened by Professor W. M BAYLISS and Dr H. H. DALE.

Professor BAYLISS said: The condition known as "traumatic," "surgical," or "wound" shock, although well recognised, is difficult to define. It may be said to be a state of general collapse, associated with low blood pressure, and the various phenomena dependent on this low pressure, such as coldness, pallor, sweating, and so on. Perhaps the most serious consequences of the deficient circulation are those due to the deprival of the necessary supply of oxygen. The remarks that follow refer to what is usually known as "secondary shock," since it is this that demands practical interference. The sudden "primary" shock that occurs on the receipt of an injury is analogous to fainting and is doubtless of nervous origin. It has its interest and importance and will probably receive attention in the course of the discussion. While, indeed, nervous factors are not dealt with in my short account, their possible coöperation in the production of the vascular phenomena forming the basis of secondary shock has to be kept in mind. It will suffice to mention those causes which have been found, on investigation, not to be the agents responsible for the state: arterial or venous dilatation, heart failure, acidosis, vasomotor paralysis, suprarenal exhaustion. The low blood pressure is, in practice, the most important feature of the condition, since it gives a direct indication for treatment. Indeed, one may say in general that, both experimentally and clinically, if the blood pressure is restored the other symptoms disappear, some with rapidity, others more slowly.

Causation of Deficiency of Volume of Blood in Circulation.

In the course of investigation it has gradually come to be realised that the chief, if not the only really important, factor is a *deficiency in the volume of blood in circulation*. This applies not only to that form of shock brought about by actual loss of blood out of the blood-vessels, but also to cases where there is no reason to suppose that there has been any great loss of blood. Apart from the fact that the general symptoms of hæmorrhage and shock are very similar, estimations by the "vital red" method of the volume of blood in circulation have shown that it is decreased in both cases. The name "*exæmia*" has been proposed by Lieutenant-Colonel Cannon for the general condition. It is clear that blood must be accumulated or held up somewhere or other in dilated regions of the vascular system. Observations made in the course of abdominal operations give no support to the view that there is any significant degree of dilatation of the arteries or veins of the splanchnic area. The region in question must therefore be that of the capillaries. Observations by Colonel Cannon had already suggested that there is stasis here in wound shock.

But what is it that brings about such a dilatation of the capillaries? At an early date in the discussion of the problem it was pointed out by Major-General Cuthbert Wallace that operations involving injury of large masses of muscular tissue were especially liable to produce shock. Experiments by Colonel Cannon and myself in the beginning of last year showed that crushing the thigh muscles of cats was followed by a progressive fall of blood pressure and other signs of shock. We found that section of the spinal cord above the origin of the limb nerves did not prevent the result, whereas clamping of the artery and vein did do so. Some chemical product of the tissue injury must then be the responsible agent. This view was confirmed more especially by Major McNee's observations on wounded men in a state of shock, where it was found that excision of the injured parts, or even preventing by a tourniquet blood passing through it from entering the general circulation, was followed by marked improvement. We thought at first that the toxic agent might be lactic acid, but experiment showed injection of this or other acid to be innocuous. In fact, "acidosis" turned out to be a negligible factor in the causation of shock. It is the result.

not the cause, of the low blood pressure. The real agent is a much more toxic one. Dale and Laidlaw have described the action of a base, *histamine*, which has the remarkable effect of powerfully dilating the capillaries, but not the arterioles, and which in larger doses produces a condition of profound shock. There is reason for believing that substances of this kind are produced in injured and disintegrating tissues. It was found further that massage of the injured muscles in the experiments on cats resulted in accelerated fall of blood pressure, so that we have an experimental justification for keeping injured parts as immobile as possible, as is done by the Thomas's splint in the case of fractured femur. These injury effects are, of course, intensified by causes tending to depress the circulation, such as cold, anxiety, fatigue, thirst, hæmorrhage, and so on.

Treatment.

The indications for treatment seem obvious. The volume of the blood in circulation must be increased. While transfusion of blood itself is the natural means, it is clear that if a satisfactory substitute, in the form of an artificial solution, could be made, it would frequently be of value. No simple saline solution, whether iso- or hyper-tonic, or containing sodium bicarbonate or calcium salt, has any permanent effect. The liquid introduced does not remain in the blood-vessels for more than half an hour or so. To ensure that it shall not leave the circulation, the addition of a colloid is necessary. The function of this is to attract water by its osmotic pressure and so to counteract the filtration produced by the blood pressure. Of those colloids admissible gum arabic is, on the whole, the most satisfactory. To correspond with the proteins of the blood plasma a 6 or 7 per cent. solution in 0·9 per cent. sodium chloride is correct. Such a solution has been found in practice to serve as well as one containing bicarbonate or excess of calcium. The use of vaso-constrictor drugs is to be deprecated. It has been found that the reserve of hæmoglobin is sufficiently great for recovery to take place even when it is reduced to a quarter of its normal value. Hence, it would seem that gum-saline should be effective in the majority of cases. A reduction of hæmoglobin to the extent mentioned implies a loss of blood of nearly 4 litres in man. It has not yet been possible to state definitely what are the clinical signs showing the necessity for blood transfusion, apart from actual determinations of the blood volume and hæmoglobin percentage. Some surgeons state that no case failing to react to gum is amenable to blood. If, however, the delay between injury and treatment has been great, no measures avail. The tissues, especially those of the nerve centres, as shown by Colonel F. W. Mott, become so far damaged by the low blood pressure and want of oxygen that recovery is impossible.

In actual practice the following general procedure may be recommended:—If the patient is cold and fatigued by a long journey, try first the ordinary measures of resuscitation, such as warmth, water to drink, and rest. If little or no improvement in half an hour or so, 750 c.cm. of warmed gum-saline slowly into a vein. This may probably be insufficient in amount. Therefore, if some benefit in half an hour, more gum-saline. If no result at all from the first injection, transfusion of blood if available. But the evidence on the whole suggests that if gum-saline is ineffective blood will be also useless, except in the rare cases where the loss of blood has been more than 75 per cent. of the total volume.

Investigation by the Shock Committee (Medical Research Committee).

Dr. DALE traced the historical connexion of the point of view arrived at by the Shock Committee (Medical Research Committee) with work done before the war. The reflex inhibition of heart and vascular tone, demonstrated in the classical experiment of Goltz, probably accounted for the condition of immediate collapse which surgeons in the war had called "primary shock." The more slowly developed "secondary shock" had formed the subject of the Committee's investigations. When these began, Crile's conception of this condition as due to exhaustion of the vasomotor centre, leading to arterial dilatation and collection of blood in the great veins, was widely held. Communications from surgeons in France, however, showed that the condition of shock as seen in the clearing stations corresponded rather with a conception which had grown out of the work of Malcolm, Henderson, Mann, and others, according to which the essential feature was a deficient volume of blood in effective currency—an "oligæmia." This loss of volume was due partly to loss of plasma from the vessels, as Sherrington and Copeman first pointed out, but the defect of return to the heart was not wholly explained by such loss. Lack of tone in the arteries would not account for such a condition, and according to the clinical evidence the arteries were contracted rather than dilated and there was no sign of accumulation of blood in the great veins.

The Committee had failed to identify any nervous mechanism by which such a complex could be produced, though their failure did not prove that nervous factors could be excluded. They had considered and rejected the claims put forward for "acidosis" as a cause. A clue to a factor of probable importance was given by work carried out by Dr. Laidlaw, Professor Richards, and the speaker on the action of the base "histamine," the effect of which could be taken as a type of the effects of a large class of protein cleavage-products, formed by autolysis, bacterial action, &c. Histamine and substances having this type of action, when injected into anæsthetised animals, produced the anomalous association of arterial constriction, with fall of arterial blood pressure and concentration of the blood by loss of plasma. The output of the heart failed because the return of blood to it was inadequate. Analysis of the action of histamine had led to the conclusion that it caused general dilatation of the capillary blood-vessels, and later a morbid permeability of the endothelium; the blood tended to accumulate at the periphery, to become concentrated by loss of its plasma, and to stagnate in the capillaries, so that the heart and larger vessels became depleted and a large part of the blood ceased to circulate effectively. The condition thus described obviously represented a rapid generalisation throughout the system of a process which, if occurring locally, would be recognised as inflammation. The analogy between the condition of the blood-vessels in shock and that seen in inflammation was pointed out by Malcolm in 1893.

The Toxæmic Factor in Shock.

The next step was to show that shock could be produced by absorption from injured tissues of substances having this type of action. This had been demonstrated by the experiments of Professor Bayliss and Colonel Cannon, who had shown that massive trauma of the muscles of a limb caused shock, even when the nervous connexion with the rest of the body had been interrupted, but that occlusion of the vessels to the injured part prevented its occurrence. These experiments, with their therapeutic implications, had been fully dealt with by Professor Bayliss. Major-General Cuthbert Wallace had early pointed out the association between shock and extensive injury of the muscles. This had been further accentuated by the clinical observations of Colonel Cannon, Major McNee, and others. The French surgeons, Quénu and Delbet, had independently reached similar conclusions as to the importance of a toxæmic element in shock. It should be pointed out that, though injury to muscles had figured prominently in war wounds, toxic substances having this type of action were especially abundant in the stomach and small intestine, and their presence might be significant in connexion with the familiar association of shock with injury to, or rough handling of, those viscera.

The Committee were not putting forward this conception of "traumatic toxæmia" as a complete explanation of all kinds of shock. They believed it had been an important factor in shock as seen during the war. The definition of shock was by symptoms, not by causation. Probably in many cases unrecognised hæmorrhage and infection played a great part. In others, causes as yet unknown might be at work. The Committee believed that they had identified a factor of which the importance had not yet received adequate appreciation. The important points for discussion were, how far the conclusions drawn from the study of shock as seen in the war were applicable to the conditions of civilian practice, and how far the therapeutic measures which had proved of value in war were likely to be of similar value in peace.

Discussion.

Lieutenant-Colonel F. W. MOTT, F.R.S., said the investigation of the brain in various conditions of shock was difficult, and the results of his observations and experiments regarding the bio-physical and bio-chemical changes seen

required confirming by further investigation. He showed, by means of the epidiascope, slides illustrating the vascular changes in (1) shell shock; (2) shell shock with burial and probably gas poisoning; (3) extensive burn shock; (4) wound shock; and (5) shell shock with cardiac contusion. All the cases of shell shock had a great fall of blood pressure before a fatal termination. The burn shock and wound shock cases died pulseless in spite of the injection of gum solution. Shell shock brains were characterised by hæmorrhages into the sheaths of the vessels and minute scattered hæmorrhages; they were due to a rupture of very small vessels and the escape of blood into the peri-adventitial sheaths or into the brain substance. In wound shock, shell shock, and burn shock there was evidence of engorged veins in the meninges, and in the substance of the brain there was venous and capillary stasis, with associated marked anæmia.

Mr. J. D. MALCOLM referred to his work on the subject in 1893 and 1905. He considered that the conception of shock as arising primarily from a reflex vascular contraction, extending from the periphery to the centre, fully explained every change known to take place in the condition. When the vessels became generally contracted the cubic capacity of the vascular system must necessarily be reduced, and so the quantity of blood in the vessels must be diminished. One of the constant features of severe shock was profuse sweating; much fluid escaped from the vessels and from the body generally. He agreed as to the great importance, in the face of severe hæmorrhage, of giving ample fluid to compensate for the loss, most usefully when the state of shock was developing.

Results of Clinical Experiences.

Captain KENNETH WALKER'S remarks were based on his experience of primary shock, that supervening before the man's arrival at the casualty clearing station, but he devoted special attention to the points which might have a useful bearing on civil practice in the future. The careful and exact work during the war on blood volumes carried out by Robertson and Keith at the base was most valuable in this connexion; they showed that the volume of blood after hæmorrhage sometimes fell to 50 per cent. or 60 per cent. of its original figure; hence the importance of maintaining the body's fluid reserves. The speaker had found that critical cases made a dramatic recovery from their shock when transfused with bicarbonate after blood. He did not think either blood or bicarbonate alone could have produced the same effect. After the use of these fluids the general results showed a steady improvement. In judging as to the value of gum injections, the amount of transport, the degree of cold, and other difficulties the men had to suffer must be taken into account. He did not favour the use of the tourniquet for the purpose of trying to prevent the toxins from macerated muscle entering the general circulation, as it caused the man so much pain that it introduced the element of nerve shock to complicate the case.

Colonel C. J. BOND (Leicester) spoke of the varying quality of blood sera in different people, with the resultant uncertainty as to the degree of its action on the red cells and the leucocytes. He also criticised, on the basis of records of experiments on animals, the placing of patients with shock in the full supine position, owing to its action in impeding the heart. This was confirmed by the fact that patients distressed with heart disease naturally assumed the posture of leaning forward. With regard to the injection of gum in cases of shock, that had not maintained its reputation among the officers with the Macedonian Army, but the difficulties of transport there were certainly very real.

Dr. C. H. S. FRANKAU quoted figures to show the unfavourable effect of cold on these cases, the wounded cases on which the observation was made numbering 14 000.

Major-General CUTHBERT WALLACE summarised his clinical experiences of the cases he had seen during the war, Sir ARBUTHNOT LANE referred to the importance in shock of acute intestinal auto-intoxication, and the debate was continued by Mr. P. LOCKHART-MUMMERY and Captain H. C. BAZETT, who referred to effects of various anæsthetics and to the necessity for a more general use of oxygen in cases of shock.

Reply to Points raised in the Discussion.

Professor BAYLISS in his closing remarks said: It seems to me that something more than arterial constriction, as suggested by Mr. Malcolm, is required to explain the phenomena of secondary shock. It is difficult to realise how the loss of fluid, caused presumably by the high blood pressure, is sufficient to account for the large decrease in effective blood volume, especially in view of the fact referred to by Major-General Cuthbert Wallace that the tissues are not particularly moist. Evidence has also been presented that the arterioles are still constricted even when the blood pressure has fallen very low.

As regards the absence of marked cyanosis in shock, we must remember that a very small dilatation of the capillaries, if widely distributed, may soak up a large volume of blood, and there is always the possibility that the pale cases may have lost blood by external hæmorrhage. I understand from Major-General Cuthbert Wallace that the majority of cases of wound shock seen by him had lost blood and were pale. The blue cases were exceptional, but may have lost blood. Two particular cases, which were blue, had not lost blood.

Captain Walker's experience with a combination of blood and saline is important. It seems to show that the essential thing is to keep up a good volume of fluid in the circulation. I am somewhat surprised that he did not find gum to serve this purpose. The advantage of intravenous injection of gum over forced fluid by the alimentary canal is the rapidity of its effect—sometimes a matter of importance. When the state of shock is due to capillary stasis it has always seemed to me that the advantage of gum over saline is that it keeps up a good circulation until the capillary blood has been restored to the main body of the circulating fluid. Saline leaves the vessels too quickly to ensure this; otherwise there is no obvious reason why it should not serve the purpose when no blood has been lost by hæmorrhage. With reference to the bad effects of deficient oxygen-supply in anæsthesia, the question as to why they are so lasting is an interesting one. It was also the case in the experimental shock investigated by Cannon and myself.

There seems to be no doubt that the cases in Macedonia, referred to by Colonel Bond, were not treated sufficiently early. They were all desperate cases. The transfusion of blood was not performed. It has frequently happened that the first dose of gum is insufficient in amount and that a repetition effects the desired object. It is remarkable how large a quantity can be given without harm. It is also to be kept in mind that some samples of gum are ineffective, for some unknown reason. I have not found this to be the case with that sold as "Turkey elect," which was used for the supply in France. The cross-circulation experiment suggested by Mr. Lockhart-Mummery would be valuable. But the fact that shock is produced by muscle injury in cats when the nervous supply of the limb is cut off shows that there is something in addition to nervous reflexes.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

Discussion on Reconstruction in the Teaching of Obstetrics and Gynæcology to Medical Students.

A MEETING of this section was held on Feb. 6th, Mr. J. D. MALCOLM, the President, being in the chair.

Dr. W. S. A. GRIFFITH opened a discussion on Reconstruction in the Teaching of Obstetrics and Gynæcology to Medical Students. He gave a general survey of the subjects to be taught and of the methods of teaching them, accentuating the importance of a thorough training in obstetrics for students of medicine. Gynæcology, he said, was so intimately bound up with obstetrics that any attempt to teach them as separate subjects was futile, though there was much in each subject to be taught independently. He discussed the subject under the following heads: (I.) subjects necessary to be taught; (II.) methods of teaching.

(I.) *Subjects to be Taught.*

The *obstetric anatomy of the pelvis* must be taught by the obstetrician; the *anatomy of the pelvic organs*, not necessarily in minute detail, but with the greatest accuracy.

The *physiology of the generative organs*, including menstruation, puberty, and the climacteric, must be taught by the obstetrician whose experience would enable him to give the student a view of its far-reaching importance in health and disease, mental and physical.

Pregnancy.—(1) The general structural changes in all parts of the body affected by pregnancy as well as the

special organs and their functions, by which the symptoms and physical signs are recognisable in diagnosis. (2) The general development of the ovum into the mature fœtus, placenta, and other parts. (Minute details of development are unnecessary in this course.) (3) Morning sickness. (4) Duration of pregnancy and the prediction of the probable day of confinement. (5) The various positions of the fœtus and the means for recognising them.

Labour.—(1) The general process and phenomena. (2) The doctors' and nurses' duties in preparation for and during labour. (3) Anæsthetics and substitutes. (4) Drugs—ergot and pituitrin.

The Puerperium.—The process in general, and phenomena. Lactation; breast-feeding; care of the breasts; doctors' and nurses' duties; doctors' and nurses' fees.

Pathology.—(1) The pathology of pregnancy, intra- and extra-uterine, with the diagnosis and treatment. (2) The pathology of labour; the treatment of many obstetrical complications should be taught, not only by methods applicable when skilled assistance, trained nurses, and the most approved instruments are available, but in the circumstances when the attendant has to rely on himself and simpler resources. (3) The pathology of the puerperium. (4) The pathology of the young infant. (5) Artificial feeding of the infant.

(II.) *Methods of Teaching.*

The means at our disposal comprised demonstration-lectures, laboratory, museum and post-mortem work, clinical work, and teaching in wards and out-patient departments. All subjects which involved diagnosis and treatment should be taught during the time that the student was engaged in his clinical work in obstetrics and gynæcology; instruction in obstetric anatomy, menstruation, normal pregnancy and labour should immediately precede this course; the student should have completed his course in medicine and surgery, including pathology with bacteriology, before taking the special course. He disapproved of the long, wearisome courses of lectures which were customary in the medical schools, but considered that good lectures, well illustrated by personal experience, were of great value to advanced students. Demonstration-lectures were very valuable, especially if well illustrated and with plenty of *viva voce* questioning. The subjects which could be taught well in this way were the obstetric anatomy of the pelvis and its contents; menstruation; the anatomy of pregnancy, of labour, and of the puerperium; and the mechanism of labour, which should be taught with a fœtus, not with the fœtal skull only. The whole of the remaining subjects should be taught by demonstration-lectures accompanying clinical work in the wards and out-patient rooms.

With regard to gynæcology, the large out-patient departments of the hospitals, if properly organised for teaching, afforded valuable means of instruction, the students attending for three months and having charge of the cases allotted to them, preparing the notes and examining the patients individually with the physician. If the case-taking was done systematically the students would gradually acquire the power of forming correct opinions about the nature of the ailment from the history alone: a very valuable asset to the young practitioner, especially in gynæcological cases, where the patient might hesitate to allow him to make a proper examination. This personal responsibility for forming correct opinions for diagnosis, prognosis, and treatment could not be inculcated too soon; it was an unpleasant experience to have to begin to acquire it in practice.

Teaching of Obstetrics in Out-patient Departments.

Out-patient obstetric work comprised two distinct departments: (1) The attendance by students on patients in their own homes; (2) the attendance of pregnant women in the out-patient department of the hospital.

The value of the former to the student was very great. The responsibility he met with compelled him to find out his deficiencies on the one hand, and gave him confidence and self-reliance on the other. The training in the out-patient department was also valuable. He learned to diagnose pregnancy when advanced; to diagnose the position of the fœtus and the presentation by abdominal and vaginal examination; to measure the pelvis; to recognise and deal with abnormal presentations and various other complications; to examine the breasts, and what could be done to relieve conditions which might interfere with lactation; to examine the urine, and in doubtful cases to obtain a catheter specimen; to examine the vulvo-vagina for evidence of infection, and to take the necessary steps for thorough disinfection and treatment. Above all, he would learn the value of the systematic examination of all women advanced in pregnancy and the advantage of being sure that all important details were normal before confinement, and of being forewarned of difficulties and complications.

Gynæcology.—Owing to the abundance of surgical material at the present time the student learned too little of the minor gynæcology which would come to him in general practice, and was induced to take little interest in cases not needing operative treatment. He learned little of the treatment of the ordinary common cases of dysmenorrhœa or of the methods for the relief of cases of inoperable carcinoma, which he would have to attend to the end.

Organisation of Maternity Wards or Hospitals.

With regard to clinical means for teaching obstetrics, Dr. Griffith said that no branch of medicine and surgery could be properly taught in an out-patient department only, especially when the department was scattered over an area of, say, a square mile, with no real and effective supervision and without the aid of competent nursing. Hospital authorities had provided a few beds for special cases, but though these were of immense value they were but a pittance. He thought that the value of a hospital for teaching purposes was not necessarily in proportion to the number of its beds; this depended on the number being adequate and on the ability of those in charge of it to make the best use of them. At Queen Charlotte's there was the great advantage of teaching at the bedside and in the labour wards mixed classes of students, both undergraduate and post-graduate, together with midwives and monthly nurses, and it would be difficult to determine who gained most from the mixed classes—the students, who soon discovered how little they knew of the nurses' duties, or the nurses, who gradually began to realise their own ignorance and the difference between their superficial training and that of the doctors. This combined training, if general, would, in his opinion, also do much to place the relations of doctor and midwife on the friendly footing of mutual confidence and help that should exist for the benefit of the poorer women and their infants. The organisation of the maternity wards or hospitals in our great teaching centres should be improved and made comparable to those devoted to medicine and surgery. A three months' combined course in obstetrics and gynæcology, the whole time being given up to the subjects, would probably prove to be sufficient.

Mr. JOHN S. FAIRBAIRN discussed

The Teaching of Obstetrics and Gynæcology from the Standpoint of Preventive Medicine.

He said that he had chosen this aspect of the reconstruction of our teaching methods, because the most definite movement in medicine was clearly that towards its preventive side. The proposed Ministry of Health and the talk of a State Medical Service were indications of how this movement dominated the situation. The case for reform in this direction had been greatly strengthened by the publication of the Memorandum on Medical Education in England by the chief medical officer to the Board of Education, Sir George Newman. He quoted Sir George Newman's chief criticism on the teaching of obstetrics and gynæcology:

> "Above all, the student is not being taught midwifery from the standpoint of preventive medicine. It is not sufficient to require mere attendance on 20 cases of childbirth, to be got through somehow. There are direct and serious responsibilities resting on medical practice during the ante-natal stage, at the confinement, and post-natal. The maternal accidents of confinement, the gynæcological conditions following unskilful obstetrics, and the infant mortality incidental to childbirth must be prevented. The need is insistent and widely recognised."

In speaking of the teaching of preventive medicine, Sir George Newman said:

> "But much more important will be the revitalisation of the whole subject of medicine by the experimental, the scientific, and the preventive spirit. For preventive medicine is not a subject which can be taught *ad hoc* or in a watertight compartment. Its purpose and its spirit should pervade the entire curriculum and system of medicine—the practice of physic, surgery, obstetrics, psychiatry, pediatrics, and the other specialities, for they all need the inspiration of the true preventive method, yielding a deeper and a wider consideration of each patient."

Teachers of midwifery and gynæcology had special opportunities and, therefore, special responsibilities in this regard. Midwifery and the diseases of women must be considered

as two branches of one subject and studied clinically at the same time and under the same teachers. Sir George Newman made a point of the teaching of the two subjects of obstetrics and gynæcology being taken together. In this way the study of the normal and abnormal processes of reproduction would go hand-in-hand with the diseases of the organs concerned in reproduction, so that cause and effect would be considered together—labour and abortion in the production of pelvic disease, and pelvic disease in the production of abortion and sterility. This simultaneous soaking-in of the two divisions of the one subject was essential if the preventive aspect was to be emphasised. In the one the student was taught how to avoid the injuries and infections of childbed, and in the other was shown their consequences, immediate and remote.

Hospital Provision for Teaching.

The medical school must provide for the adequate training of its students. (1) The maternity centre would require both out- and in-patient accommodation for the pregnant woman, the woman in labour, and the mother and nursling. In many hospitals this would involve an increased provision of beds for maternity work, say five or six beds for pregnant women, a maternity ward sufficient to allow each student five or six cases indoors before attending cases in the outdoor district, and three or four observation beds and cots for mothers and infants. As this provision for teaching was absolutely necessary, it was useless to accept a *non possumus* attitude from medical colleagues or hospital committees. The accommodation must be provided if the medical school was to train the practitioners of the future. Arrangements might be made with lying-in hospitals, Poor-law infirmaries, maternity centres, and infant welfare clinics in the neighbourhood, and the work of the student carefully organised so that he obtained a proper perspective of the scheme as a whole. (2) The department for diseases of women was part of the establishment of every hospital with a medical school. Provision should be made for the reception of cases of puerperal infection in all stages, and for cases of gonorrhœa in the earlier stages, as they were often withdrawn from the student's range of vision by being relegated to a special venereal disease clinic, thus spoiling the completeness of the preventive view. (3) A full staff of workers would consist of (*a*) medical officers and the students; (*b*) nurses and midwives for indoor and outdoor patients; and (*c*) almoners and health visitors.

Outline of Requirements.

He then described the atmosphere in which the student should be trained during three months in the practice of midwifery and diseases of women. He laid special stress on the student being taught in the clinic for pregnant women to look for the beginnings of disease and to consider the individual character, mode of life, and home conditions of each patient as factors in her case. In the maternity ward all preventable conditions which occurred were discussed as to why they were not foreseen and what could have been done—eclampsia, macerated fœtus, or some unexpected difficulty in labour. All failures as well as successes in ante-natal management should be emphasised, especially failures to breast-feed, retracted and sore nipples, and such points which were not likely to attract the student's attention unless specially drawn to them. His interest was easily stimulated in breast-feeding as an important part of the prevention of infant mortality, and this was one of the matters on which pupil midwives, nurses and medical students could all be taught together.

On the district the student had to adapt methods acquired under ideal conditions with every convenience to his hand to conditions quite the reverse—in itself a great education. The student should be associated in the work of the social side—obtain reports from it as to his patients, and be encouraged to make a report to it on ceasing attendance. If instructed on the proper points to observe he might give much valuable information as to the hygiene of the home, the woman's capacity as a mother, whether she followed her instructions as to the feeding and care of the baby, and possibly be able to offer suggestions as to special watching of the patient afterwards. A greater effort must be made to interest the student in the study of the baby, and to keep up the study long after the infant has passed from the care of the obstetric department.

This led up to the very important question as to where the dividing line between obstetrics and pædiatrics was to be drawn. There was something to be said for mother and nursling remaining under the obstetric department and the weanling and older children going to the children's department. The mothers who were patients of the obstetric side during pregnancy, labour, and lying-in were known and understood and more readily influenced by its officers; difficulties in breast-feeding and the overcoming of them were frequent problems in the maternity ward, and naturally a continuance of the same interest and supervision was advantageous. The plan in contemplation at St. Thomas's Hospital was that of the appointment of a special officer for the child-welfare clinics, who would begin by taking part in the teaching on the infant in the maternity ward, where he would become known to the mothers and learn to know them, and thus preserve continuity from the maternity clinics to the baby clinics.

The beds for mothers and nurslings need be but few—three or four should suffice unless the department was very large—and into them should be admitted cases of difficult breast-feeding and such like; they were as necessary for the student's education as for the mother's. The student should follow the mother and child through the clinics so as not to lose the practical object lesson in prevention which a complete survey of the scheme would give him. The student's time was now so far occupied with work that had a distinct examination value that he could not spare the time for work that had only a practice value, and therefore little more than casual attendance at the welfare clinics could be expected, except perhaps by a few of the more far-seeing or specially interested students. Every student should have a six months' training in obstetrics, gynæcology, and pædiatrics. The first half of this term would be as sketched and would be followed by three months in the various children's clinics.

Creation of Atmosphere of Preventive Medicine.

He drew attention to the "psychological aspect of preventive medicine, hitherto greatly neglected." We had become so absorbed in operative work and hospital accommodation had been so monopolised by operation cases that our teaching material was in no way representative of the future practice of our students. The resulting tendency had been to overlook the most common of all factors in the production of disability, overstrain and mental stress. In women with pelvic symptoms such causes as domestic worries, family anxieties, and marital and sexual troubles played a very important part. As Sir George Newman said, "preventive medicine to be effective must deal with the man, the whole man, as an individual as well as member of the community." In short, we must acknowledge the special responsibility on us to create an atmosphere of preventive medicine round our teaching, and for this purpose every medical school must be provided with a complete maternity and child-welfare centre. By coöperation with the pædiatric side instruction covering a period of six months should be continued from midwifery into child welfare, so that the student, while acquiring the practice of obstetrics, gynæcology, and pædiatrics, was made to feel that he was playing at any rate a minor part in a scheme of preventive medicine, the complete working of which he could visualise. As the study of obstetrics and gynæcology brought to the student "new applications of his clinical experiences, new social relationships," it was incumbent on us not only to teach the actual practice of these subjects but to give the student a wider outlook and to teach him to apply his professional knowledge towards increasing the resistance of the normal to disease and arresting the progress of incipient disease, and so raising the whole standard of the health and physique of the nation's mothers and children. This involved a fuller consideration of the social factor, the psychological factor and other factors affecting the life and well-being of the individual patient and of the community as a whole.

Dr. LOVELL DRAGE spoke on

The Teaching of Obstetrics and Gynæcology from the Point of View of a General Practitioner.

He drew attention to the increasing demand made upon the time of the student by the teachers of special departments. The time of the student could be saved by the exclusion of the preliminary subjects of study; chemistry, physics, morphology, and physiology should be undertaken previously to registration as a student; and, until a sufficient test had been applied, registration

should be denied. A very large part of gynæcology was purely surgical and should be treated as part of the course in surgery. The subjects to which the teachers of diseases of women and midwifery should devote themselves should be just those which were theirs before surgery arrived at its present state of perfection. The special importance of a knowledge of the various infective agents should never be out of the mind of the student, and would never be if the course in general pathology had been sufficiently appreciated. If practitioners would but consider it a disgrace when they had a case of infection after delivery there might be a chance of the practical banishment of puerperal fevers caused by infection. Knowledge of the infections of the genital tract of women was of more importance to the general practitioner than a knowledge of anything else in the whole of the subject of obstetrics and the diseases of women. Much depended upon the teachers of the subject and much less on schemes of teaching. The subjects of obstetrics and gynæcology were not large in themselves, and three months would be sufficient time for students to expend on them before examination at the final Board.

The question now arose—especially in view of the prospects held out by the promotion of a Ministry of Public Health—whether all students should be compelled to undertake the subject before registration as practitioners. Many men did not intend to practise obstetrics or dabble in gynæcology; and there did not appear to be any reason why the time and energy of such should be wasted in cramming up sufficient knowledge to pass an examination. The basis for the demand to the medical profession that it should take up the work of supervision over maternity centres appeared to be that it was impossible to manage an A 1 empire with a C 3 population. One reason for the statement that we were a C 3 population was that the medical profession for many years past had successfully prevented the destruction of the class which in Dame Nature's scheme was classed as unfit. In addition, the birth-rate had steadily declined. In his sanitary district in 1886 there were 220 births; for the five years before the war the average was 190, with an increase of population of nearly 2000. The proportion of the fit to the unfit who are born into the world was probably about the same as it had always been, but we had by our attention to the unfit increased the numbers of the unfit who reached maturity. Nature provided, if left alone, a large excess of increase in our species in order to provide for the loss of the unfit. The medical profession prevented to a considerable extent the loss among the unfit, and other factors had diminished the excess in production. It did not appear that there was any reason to suppose that the supervision of pregnant mothers would produce any other result than that of raising up to maturity more unfit adults. The production of a healthy stock depended upon the healthy condition of the parents, and resistance to disease depended upon factors which at present were little understood. The practical question remained as to whether a large expenditure of public money was justified in the absence of any reason for supposing that a larger stock of healthy children, who had strong resistance to disease, would result.

The Importance of Better Obstetrical Teaching.

Dr. AMAND ROUTH thought that Dr. Drage's proposal that general surgeons should perform the operations which were now performed by gynæcologists would be a retrograde step. In a lying-in hospital the ante-natal clinic should be obviously an important part of the training of the students and midwives, and should be attended by those actually engaged in their practical midwifery. Amongst the subjects there taught were the recognition of venereal disease and the recently proved safety of dealing with syphilis by salvarsan during pregnancy and after birth; the recognition of tests for early toxæmia, especially now that accidental hæmorrhage with its 75 per cent. of fatal mortality was believed to be often toxæmic in origin, and might be preventable; pelvic contractions, both the major and minor varieties; the significance of the previous maternity history of the mother and her children; such complications as heart or bronchial disorders, old kidney disease, diabetes, Graves's disease, and pregnancy pyelitis. Labour, whether natural, prematurely induced, manipulative, or operative, should be taught in the maternity wards, and knowledge should be imparted regarding lactation, and hand-feeding where lactation failed. Students should be taught to assist in laboratory research of all kinds, such as special urinary tests for toxæmia, examination of all expelled products of conception for detection of spirochætes and other causes of death, attempts to unravel the mysteries of toxæmia, and of the functions of the syncytial ferments, examination of milk, &c. Opportunities should be found for giving students information on the causes of sterility by malformations, gonorrhœa, or as the result of operations, plumbism, X rays, &c.; on the causation of the low birth-rate, such as sterility, criminal abortion, and methodical, chemical or mechanical restrictions of child-bearing. The responsibilities of doctors in cases of criminal abortion were useful subjects to learn before private practice began.

In urging the necessity for better obstetrical teaching it was important to contemplate the fact that out of 1000 conceptions probably 250 infants died during gestation and before their first birthday, and that this proportion of deaths was doubled in illegitimate cases. Dr. Drage's statement that "medical supervision would do no more than raise up to maturity more unfit adults" was extraordinary. There seemed every reason to believe that if the methods advised in the two addresses were carried out, at least half the ante-natal and early post-natal infantile deaths would be avoided, for doctors would be thoroughly equipped in the knowledge of the preventive hygiene of pregnancy, parturition, and the puerperium.

Advocacy of a Radical Change.

Dr. G. F. BLACKER said that he had listened to the remarks of the openers of the debate with much interest, but he did not think that any one of them had really reached the root of the matter. He thought that they should seek an answer to two questions:—1. Why was the standard of teaching in midwifery not of so high a level as that of medicine and surgery? 2. Why was the reputation of the London School of Obstetrics for research so relatively poor? He imagined that this debate was being held because it was recognised that the teaching in obstetrics was unsatisfactory, and therefore it was important to endeavour to find an answer to these two questions.

He thought the answer to the first question was to be found in the fact that most of the practical teaching was done by junior men, registrars and house surgeons who often had become qualified only recently. From the very nature of the work it was generally impracticable for one of the honorary staff to be present when patients required operative interference in their confinements, and a student might well pass through the whole of his midwifery training and never see one of the senior staff conducting an ordinary confinement or performing any one of the common obstetric operations. It was impossible to arrange for practical teaching in midwifery at the bedside or in the theatre at set hours, and therefore a great deal of this part of the teaching had to be done by junior men with but little experience. It was quite easy for senior members of the surgical and medical staff to carry out teaching at the bedside, but it was very difficult for the senior obstetricians to do so. In his opinion, then, it was necessary not to consider what the student should be taught but how he should be taught and what changes were possible to overcome the present unsatisfactory state of affairs.

It seemed to him that there was only one way out of the difficulty—namely, the provision of four or more large lying-in institutions in different parts of London in which, under the same roof, the student could receive his practical teaching in midwifery, gynæcology, and maternity and child welfare. These institutions should be large enough to provide for all the medical students in London, and must be officered, if the students were to be taught properly, by resident whole-time properly paid senior teachers. They should be either whole-time or full-time. By the first he meant debarred from private practice altogether; by the second, compelled to devote so many hours a day to their work and not allowed during these hours to undertake any other work. They should further have the services of whole-time paid assistants and all the laboratory facilities necessary for the proper carrying out of the pathological work concerned in the treatment of their patients, and for research work. The present lying-in hospitals had not, in his opinion, justified their existence so far as teaching was concerned, they should be closed or amalgamated with these larger institutions.

The student should be required to spend four months in the practical study of midwifery and gynæcology, of which two should be devoted to gynæcology and two to midwifery. During his term of duty in midwifery he would be resident in the institution while on duty in the wards, and he would spend the second month of his attendance doing duty in the extern maternity department. In these circumstances students would receive their teaching from teachers of equal standing and experience to those engaged in the teaching of practical medicine and surgery, they would have ample opportunities of seeing large numbers of gynæcological and obstetrical cases and at the same time would be able to attend in the maternity and child welfare department. It would further be possible to carry out the students' practical training in the best possible surroundings. The present small number of lying-in beds in most of the general hospitals were of very little value and were wasted in most cases, as it was impossible for the students to live near or in the hospitals, and they were therefore not available when wanted to attend at emergency operations. Arrangements of this kind would enable any man who desired to do so to carry out research work with credit to himself and to the school to which he belonged, and such a development would be in keeping with the schemes which were on foot at the present time for the appointment of whole-time paid teachers in medicine and surgery. He did not think that anything short of this very radical change would ever succeed in improving the present unsatisfactory methods of teaching practical midwifery in London.

Further Discussion.

Dr. T. W. EDEN placed the responsibility for the poorness of teaching at the present time on the system of multiple hospitals. This arose from the over-staffing of the hospitals, so that each member of the staff of one hospital found it necessary to seek additional clinical material in another. Moreover, the clinical material in the hospitals was not representative of the future work of the students.

Dr. EARDLEY HOLLAND attributed the neglect of the student to (1) the claims of the midwife, who had absorbed most of the lying-in beds; (2) the apathy of modern gynæcologists towards ordinary work; (3) the idea that it was unnecessary to train the student to a high standard if this could not be maintained in after life. That obstetrics and gynæcology should be treated as separate subjects was the opinion of a few, who thought that by this means the obstetrician could devote more time to the baby; but he would like to see the infant taken over entirely from its birth by the pædiatrician, who should also be responsible for the corresponding teaching and research. He disagreed with Dr. Drage with regard to antenatal supervision. It permitted a diagnosis of the presentation, and of the presence of syphilis, albuminuria, tumours, &c. Moreover, the mothers suffered from neglect of supervision as well as the babies.

Sir WALTER FLETCHER accentuated the importance of the teaching of the normal physiology of reproduction, including lactation, which at present were imperfectly understood by the student, even at the time of his qualification.

Dr. F. J. MCCANN advocated State-subsidised maternity hospitals in London and throughout the country, and the adoption of the Continental system of whole-time resident assistants, paid a salary of, say, £500 a year. The appointment should be for five years, and the holders should travel for at least one month annually in order to bring back reports of the work in other schools. Means must be found to retain the poor man who had ability. The need had been accentuated now that the training of midwives and nurses had to be undertaken. Till such hospitals were established London would not take its place as a leading teaching centre.

Dr. E. L. COLLIS pointed out that now that women were being employed industrially to such a great extent, the student should be given definite instruction as to the amount and kind of work, &c., which a pregnant woman should be allowed to do, and should be put in a position to be able to answer questions which might arise in the course of his work as medical officer to a factory.

Other Criticisms and Suggestions.

Mr. VICTOR BONNEY said that teaching must be judged by its results. The maternal death-rate due to pregnancy and labour had remained constant for the past 70 years in spite of great progress in knowledge. Deaths still occurred from toxæmia and sepsis. Pregnancy was the growth of a neoplasm; labour was the occurrence of self-inflicted wounds; the puerperium was the healing of those wounds. A great proportion of deaths could be prevented by the application of surgical principles. He hoped to see the day when midwifery would be regarded as a subsection of surgery and taught as such.

Dr. H. WILLIAMSON preferred the clinical system to that in vogue on the Continent. Obstetrics and gynæcology should be studied simultaneously. Each student should be compelled to train for one month in a lying-in hospital before doing extern work, and should personally deliver four or five women under competent supervision. This instruction was now largely left to midwives. Every general hospital should have a lying-in ward, officered by a good teacher who knew his work. He did not agree that a large institution was necessary, for it would introduce the German system of lectures and demonstrations. Students should be examined by their own teachers, in the presence of an assessor if thought desirable. The three failures were haphazard training, fallacious examination, and the absence of an atmosphere of research.

Dr. A. LAPTHORN SMITH emphasised the necessity of impressing upon the student the importance of examining the urine to forestall eclampsia, and of wearing rubber gloves in order to prevent sepsis. He thought that there should be a great Rotunda Hospital for London with several branch ones, where thousands of poor women could be delivered by skilled obstetricians under aseptic conditions, who would otherwise be confined at home in most unfavourable surroundings. In time private rooms should be available for the rich, and the revenue from this source, as well as from the middle class, and even a little from the poor, would go a long way towards making these institutions self-supporting. The deficit could be made up in various ways, such as bequests and donations. The master would perform the deliveries in the daytime and the assistant would be in attendance at night, but every delivery should take place in the theatre under anæsthesia, and every student in a few months should have been present at a hundred cases instead of half a dozen, and have observed the methods of the very ablest exponents of the art. Each medical school might in turn be responsible for the service, under the supervision of the master, who would be elected by all the schools for three or five years. His reward would be a large consulting practice.

Lady BARRETT thought that at least six months should be devoted by the student to the study of the two subjects, of which at least one month should be spent at a lying-in hospital, before doing outside maternity work. A month should also be spent in the combined study of the pathology and physiology of obstetrics and gynæcology, the student at the same time keeping in touch with the clinical aspect of the work by attending the physician in the wards and exhibiting the specimens from the cases.

Dr. R. W. JOHNSTONE described the methods of teaching in vogue in Scotland. Teaching, including that of minor cases, should be done by the senior teachers. He did not agree with the appointment of a whole-time teacher; the emoluments would not be such as would attract the best type, and the teacher, being out of touch with the conditions of general practice, would become unable to impart to the students what they would be likely to require.

Dr. T. G. WILSON compared the teaching of this subject in London with that of other large centres. With their valuable clinical material he attributed their failure to attract overseas students to a faulty system of teaching. In such hospitals as the Johns Hopkins there were working under the head of the department as many as five or six assistants, who were only permitted to teach the students after having acted as assistant for three or four years, and having done at least one year's pathological work in the department. The subject could be taught as well in a small as in a large institution.

Dr. H. RUSSELL ANDREWS agreed with the general proposition that obstetrics and gynæcology must be taught together, that old-fashioned formal lectures were not of great value, and that students should not be sent out to attend patients in the district until they had had a thorough midwifery training in the wards. He agreed with Dr. Lovell Drage that "the medical profession prevents to a considerable extent the loss among the unfit," but felt much more deeply that the medical profession does not prevent a large unnecessary loss among the fit. The only

way to prevent this was by improving the teaching of midwifery. He disagreed emphatically with Dr. Lovell Drage's opinion that supervision of pregnant women would produce no other result than that of raising up to maturity more unfit adults. He pointed out that in cases of syphilis and in minor degrees of contraction of the pelvis, to take only two examples, supervision of pregnant women resulted in the production of A1 citizens. He considered that a department for medical supervision of pregnant women formed an integral part of a modern teaching hospital.

DR. GRIFFITH replied.

SECTION OF PATHOLOGY.

Diffuse Emphysema of the Wall of the Small Intestine.

A MEETING of this section was held on Feb. 4th, Dr. W. BULLOCH, the President, being in the chair.

Mr. C. A. R. NITCH and Professor S. G. SHATTOCK described a remarkable example of the above rare condition, which was unexpectedly found during an operation carried out for a simple stricture of the duodenum immediately beyond the pylorus, associated, presumably, with the presence of an ulcer. The patient had suffered for many years from pyloric obstruction, the stomach being so dilated as to reach the crest of the ilium. He had been in the habit of washing out the organ with a soft rubber tube. A gastro enterostomy was successfully performed, the symptoms completely disappearing afterwards. A small V-shaped piece of the affected intestine was removed for the purpose of investigation, the parts being immediately sutured without untoward result. In this the gas cysts were found to lie beneath the mucosa, the other tissues being here uninvolved. When exposed at the operation, the whole of the small intestine, with the exception of the duodenum and the first foot of the jejunum, was covered with blebs of gas.

The condition itself fell into a group to which the name "pneumatoses" had been applied[1]—a group which included the various lesions due to the presence of air or of gas in the different structures or cavities of the body. Into it fell, besides common emphysemas (bacterial and mechanical), the aspiration of air into the vagina or rectum, œsophagus, and stomach; into the peritoneum during laparotomy; the passage of gas from the intestine into the peritoneal cavity, apart from discovered perforation, in cases of chronic obstruction, &c. The entry of air occurring in operations carried out in the Trendelenburg position upon the bladder or vagina was due, of course, to the negative pressure caused by the gravitation of the abdominal viscera; in œsophagoscopy, the inflation of the canal arose from the negative pressure within the thorax. After punctured valvular injuries of the abdominal parietes a local emphysema was at times observed (M. Romanis), due to the inspiratory movements, which was liable to be misdiagnosed as indicative of perforation of the intestine. In birds Hunter had pointed out that fracture of the bones containing air might be followed by a local emphysema. The only homologue of such a result in the human subject was furnished by the escape of air that sometimes took place from the frontal sinus after fracture.

In discussing the etiology of the condition recorded, a bacterial factor was excluded by the study of sections made from the piece excised. Nor during life did the tissues exhibit any traces of inflammation. The cysts or spaces were lined with a single layer of endothelium, a multinucleated cell being here and there intercalated. After excluding a secretion or liberation of gas from the tissue plasma as an explanation, the etiology became reduced to a mechanical one. The condition could not be ascribed to distension of the gut itself, since there was no obstruction on the distal side, but air or gas must have been driven from the distended stomach through the base of an ulcer immediately beyond the pylorus, into the intestinal walls, the peristalsis of the gut facilitating the onward movement of the gas. Brouardel ("Death and Sudden Death") had described a case of submucous emphysema of the stomach about a recently perforated ulcer, but proof was wanting that the condition had occurred during life. And the same doubt existed in regard to the case recorded by Haller, in which a tympanitic distension of the intestine was accompanied with the formation of gas blebs beneath the peritoneum.

[1] J. P. Frank: "De Morbis Hominum Curandis," 1821.

MEDICAL SOCIETY OF LONDON.

Intrinsic Cancer of the Larynx.

A MEETING of this society was held on Feb. 10th, Major A. F. VOELCKER, R.A.M.C (T.), the President, in the chair.

Sir STCLAIR THOMSON read a paper on Intrinsic Cancer of the Larynx, which furnished a sequel to that read before the same society on Feb 12th. 1912. Laryngeal cancer, he said, was not a common disease, but, fortunately, the intrinsic form was more common than the extrinsic. Of 212 cases Semon found the disease intrinsic in 136. Chevalier Jackson's figures showed that the intrinsic form was more frequent in the proportion of 98 to 43, and Schmiegelow, in 66 cases of intralaryngeal cancer, found the disease limited to a vocal cord in 36. Only a restricted proportion of cases came to operation because of delay in diagnosis and sometimes because the patient did not present himself sufficiently soon. Hence the amount of clinical material was always small. In 18 years he had only encountered four hospital cases which justified a laryngo-fissure, while he had performed it 34 times in the smaller field of private practice. Of these 38 cases of intrinsic laryngeal cancer which had been operated upon, 22 were alive and well without recurrence at periods varying from 6 months to 10 years since the operation. Seven cases survived the operation but died from other causes at periods varying from 10 months to 10 years later. Local recurrence took place in only 5. Two cases died from recurrence in the glands, but without recurrence in the larynx. In one this occurred 7½ years after laryngo-fissure; in the other within 7 months. Two cases are alive, but recurred. In one the disease recurred in the glands of the neck 1½ years after laryngo-fissure, the glands were operated upon, and he is now well. In the other recurrence was suspected in the subglottic area and on the opposite side 3½ years after operation.

In these cases, comprising 4 females and 34 males and varying in age from 40 years to 75, no patient had died from a cause attributable directly to the operation. These figures, taken in conjunction with those of Semon, Chiari, and Schmiegelow, confirmed the view that the results are exceedingly good and compared favourably with those obtained by surgical treatment of cancer in other internal organs, and that the advance was striking. The figures also showed that the first year after operation was the anxious one as regards recurrence. He felt considerably diminished anxiety if the third month passed without a suspicion of re-growth. When an epithelioma was limited to a vocal cord and recurred within 12 months, he would regard it as an incomplete removal. Recurrence was more apt to take place and after a longer interval when the anterior commissure or subglottic area was involved. In none of the 38 cases had a laryngo-fissure been performed for cancer, and the disease found to be of another character, but in several cases the diagnosis had to be deferred for a time, varying from a few months to a year.

The Operation.

In addition to the usual preparations, the mouth and teeth are rendered as clean as possible and tobacco and alcohol are reduced to a minimum or cut off for three days before. A dose of bromide (15 to 20 gr.) is given on the previous evening, but neither morphia nor atropine. Half an hour before the operation the line of the incision is infiltrated with eudrenine (a solution of eucaine and adrenalin). The skin of the neck is purified with soap and water and a carbolic dressing, and not damaged by painting with iodine. A general anæsthetic, preferably chloroform, is given in the usual method. One long incision is made from the thyroid notch to the sternum. 10–15 drops of a 2½ per cent. solution of cocaine, to which a few drops of adrenalin are added, is injected intratracheally, and a similar injection made through the crico-thyroid membrane. Medium tracheotomy after dividing the thyroid isthmus, if it cannot be hooked upwards and downwards, can then be carried out without spasm or cough. A large-sized Durham tracheotomy tube is then introduced and the thyroid cartilage divided exactly in the middle line with saw, knife, scissors, or shears. A Killian's median rhinoscopy speculum is then used to dilate and inspect the endo-larynx. After application of 5 per cent. cocaine and the insertion of a gauze plug through

the thyroid opening over the top of the tracheotomy cannula, the larynx is semi-dislocated sideways to bring the affected cord more *en face*. This is then raised, with all the soft tissues, by a subperichondrial dissection. The outer perichondrium of the thyroid cartilage is peeled off and the greater portion of the ala clipped away, and the growth subsequently removed, with a good margin around it, with curved scissors. Bleeding is arrested by pressure, the tracheal plug removed, and the thyroid opening closed by drawing the soft tissues together over it. Deep (catgut) and superficial (silkworm and horse-hair) sutures close the whole external wound, except opposite the tracheal opening. The tracheotomy tube having been removed and a dry gauze dressing applied, the patient is returned to bed in a sitting posture.

He spoke emphatically of the value of open chloroform administration in these cases, at first through the mouth and later through the tracheotomy cannula. Most of the patients were able to swallow within a few hours and many of them sat out of bed and read their newspaper the same evening. It was the exception for the patient not to be sitting up in a chair next day and eating semi-solid food. The preliminary infiltration of the skin incision with eudrenine and the intratracheal injection of a 2½ per cent. solution of cocaine greatly attributed to this satisfactory result. He preferred one long incision to the two which had been proposed—i.e., one over the larynx and one for the tracheotomy—considering the slight cosmetic gain in the latter procedure more than counterbalanced by the greater facility and safety of one long incision. He could see no gain in abandoning the safeguard of tracheotomy. There was no need to plug off the pharynx through the split larynx. In 25 cases the tracheotomy tube had been withdrawn as soon as the operation was completed, but in two it had to be replaced for sharp hæmorrhage. He was glad that in both there had been a preventive tracheotomy, and that the skin in the neck had not been stitched up over it. He saw no great objection to retaining the tube for the first day, particularly when there was a tendency to bleeding at the time of the operation, or the patient was congested or with a history of alcohol and tobacco, or when the growth was very extensive or largely subglottic, or should no experienced surgeon be at hand. Excision of the thyroid ala left no drawbacks and facilitated removal of the growth and control of bleeding.

After-treatment.

His patients were placed in bed with a bed-rest, almost sitting upright. The same evening many could sit out of bed and were able to drink sterilised water. The appearance of a large granulation in the wound during healing sometimes caused much anxiety. In 11 cases it was detected at times varying from 15 days to 2 months after laryngo-fissure. It appeared on the cicatrising cord or in the anterior commissure. In 4 cases it was left alone and took from 3 to 12 months to disappear. Of the other 7 cases he removed it through the mouth and under cocaine by McKenzie's duck-bill forceps in 5. In one of the remainder it was subglottic in position and so large that stenosis was threatened, and tracheotomy had to be done. The tube was worn for six weeks, after which time the granuloma had disappeared. In the other a large granulation, the size of a cranberry, appeared in the anterior commissure two months after operation and proved to be an exostosis. It caused little trouble and was still present two years after the operation. The patient was 72 years old. Most patients were sitting out of bed and eating solid food on the day following the operation. They suffered no shock and recovered rapidly. The windows were left freely open day and night. The old paraphernalia of screens round the bed, closed windows and "even temperature," steam kettles, and such like had long been abolished. It had been his custom to keep the patients silent for the first three weeks. They then started whispering, and as soon as a good cicatricial cord had replaced the one removed they were not only encouraged to speak, but in cases of bad speakers further improvement was secured by sending them to a voice trainer. The voice was always sufficient for the ordinary purposes of life; schoolmasters had been able to continue their profession and others could make public speeches. But all the patients had not been kept silent for these first three weeks, and he thought that by earlier resumption of vocal use there had been better compensatory results and not that tendency to contraction which had been observed in two of the most silent cases. He now thought a week's silence was sufficient. If patients applied early with epithelioma limited to a vocal cord the death-rate should be nil, the restoration of voice satisfactory, and the cure lasting.

Discussion.

Surgeon-General BIRKETT, C.A.M.C., agreed that fixation of the cord was no invariable sign. All must have seen cases when it was absent.

Mr. WILFRED TROTTER said that his practical experience was confined to conditions extra-laryngeal. He had been removing the ala of the thyroid cartilage for ten years for another reason—namely, to obtain access to the upper part of the larynx—and consequently had removed the ala more completely, including both cornua. He had probably removed the whole ala 50 times, and there was no evidence that it interfered with the recovery of the patient's voice. It was a harmless and very useful procedure. He had never ligatured or clamped the thyroid isthmus, and no evil results had followed. An important reason for dividing the isthmus was that if the tracheotomy tube had to be removed the isthmus could not descend over the opening and hinder its replacement. He had known lives sacrificed in this way by leaving the isthmus intact.

Dr. W. HILL mentioned a case in which fatal hæmorrhage had occurred as evidence of the value of retention of the tracheotomy tube and plugging temporarily, for by this means death might have been avoided.

Mr. HERBERT TILLEY had operated upon 22 of such cases. He thought that this kind of cancer might form a basis from which some clear ideas might be evolved on the infectivity of the disease. In this respect cases in which growth recurred 10 12 or more years after operation were interesting. He doubted whether "recurrence" was the proper term, and queried whether an immunisation took place and that the so-called "recurrence" followed when that immunisation wore off.

Mr. IRWIN MOORE advised that the tracheotomy tube should be left *in situ* for a few hours if neither the surgeon nor a dependable substitute were within immediate call. There was particular risk in leaving a patient with no tube after low tracheotomy. The results of operation were so good chiefly because the operation was done early and the diagnosis was established. He hoped for more coöperation with the general physician in cases of persistent hoarseness.

Mr. C. MCMAHON offered the following practical suggestions for re-education of the voice in these cases: 1. Develop the sterno-thyroid and sterno-hyoid muscles, and keep the larynx low. Use a tongue depressor to help to accomplish the descent of the larynx. 2. Make the patient speak as little as possible until a deep pitch of voice is established. 3 Let the breathing movement be inferior lateral costal, with a small but definite expansion, and let the motive power of the voice be the powerful contraction of the abdominal muscles. 4. When the larynx is established in its low position instruct the patient that voice gets its chief resonance in the head and chest, and that the throat is a conduit pipe between them, and must be entirely unconstricted; and also that free lip movement increases oral resonance. If further vocal treatment is necessary the resonator positions of vowel sounds and clearness of articulation generally should be taught. It was safe to say that a really useful voice could be anticipated in practically all cases.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

Endothelioma of the Ovary.—Exhibition of Specimen.

A MEETING of this section was held on Jan. 10th, Dr. H. JELLETT being in the chair.

Dr. J. S. ASHE read a paper on Endothelioma of the Ovary. He had removed the ovary and had previously shown the specimen to the Academy. Three months after the ovary had been removed by him and Dr. Purefoy the patient had become pregnant and was delivered of a full-term baby, the confinement being uneventful. At the time of the operation it was seen that the other ovary was small and atrophic, and he was surprised when she became pregnant.

Dr. R. D. PUREFOY said that the affected ovary was so little enlarged and so little troublesome that it might very

easily have been overlooked. The healthy ovary was so small and shrunken that its functional activity seemed somewhat problematical. The return of menstruation and conception shortly after the removal of the diseased ovary suggested that some inhibitory action was exercised by the diseased organ.

Dr. H. JELLETT said that he did not approve of leaving the second ovary if the first was known to have undergone malignant change of any kind, as the danger of a simultaneous malignant condition in both ovaries was too great.—Sir W. SMYLY and Dr. B. SOLOMONS also spoke.

Dr. JELLETT showed a pyosalpinx and ovarian abscess removed from a patient aged 23, who had a double uterus. The left side alone was affected, the right horn of the uterus and corresponding ovary and tube being quite healthy. The uterine cornu on the infected side was also removed. The pus from the abscess contained streptococci and colon bacilli. The patient was making a good recovery.—Dr. R. J. ROWLETTE also spoke.

500 Consecutive Operations at Mercer's Hospital.

Dr. BETHEL SOLOMONS read a paper on 500 Consecutive Operations Performed at Mercer's Hospital. The main conclusions arrived at were that: 1. Skin disinfection was best accomplished by some reagent which hardened the skin. Ether followed by iodine was an excellent method. 2. There was less chance of pulmonary embolism if the patients were encouraged to move about freely in bed after operation. A lengthy stay in bed was inadvisable. To prevent pneumonia and pneumonitis care should be taken that the patients were warmly clad going to or coming from the theatre. 3. Curettage, when carefully performed, was a beneficial operation. 4. Of the many operations described for the cure of backward displacement, the modification of Tod Gilliam's technique, which he described in the paper, had been found to be the best. Ventral suspension and Alexander-Adams's operation had their indications, and ventral fixation was satisfactory after the menopause. 5. When it was necessary to treat sterility by operation it was justifiable to open the abdomen to examine the state of the adnexa, even though there were no marked signs of disease. Tubes of normal size with closed ostia, hydrosalpinges, and very small cysts of the ovary were often discovered. 6. This paper on immediate results of operation for gynæcological ailments was presented as a preliminary to the presentation at a later date of the remote effects, which were more important. The percentage mortality was small, the morbidity was practically nil, and the after-results were excellent. In a large number of operations for the cure of sterility there were no deaths. By comparing these results with those obtained by the workers in radium and X rays knowledge could be gained as to which was the better.

Sir WILLIAM SMYLY said he believed in the modified Gilliam operation for backward displacement. Despite the unfortunate results which had been reported following ventral suspension, he still did the operation with satisfactory result. He did not approve of Alexander-Adams's operation, as he liked to see the inside of the abdomen. He agreed with the main principles of Dr. Solomons' paper.

Dr. ELLA WEBB asked if the cases of pneumonia were recent and if pure ether was the anæsthetic employed. She agreed that great care must be taken to keep the patients warm in going to and coming from the theatre.

Dr. R. J. ROWLETTE said that a *definite* diagnosis as to malignancy in large ovarian tumours was sometimes impossible. He thought that most papillomatous tumours were malignant. He suggested that chloroform might be reintroduced as an anæsthetic when the doctors came back from France, and he did not welcome the idea.

Dr. ASHE said that he agreed with the author of the paper that it was important to exclude the male as the cause of sterility before operating on the female.

Dr. JELLETT considered Alexander-Adams's operation to be the ideal one for all cases of undoubtedly uncomplicated backward displacement, but thought that it was contra-indicated in cases associated with sterility or any possible pelvic complication.

Dr. SOLOMONS, in reply, said that he had had no recent cases of pneumonia. Ether, or gas and ether, was the anæsthetic employed in his cases, and he would never permit the use of chloroform. He thought that many women would be saved unnecessary operations for sterility if the male semen were examined.

Reviews and Notices of Books.

The Physiology of Industrial Organisation. By Professor JULES AMAR, Director of the Laboratory of Physiological Research in the Conservatoire des Arts et Métiers, Paris. Translated by BERNARD MIALL. Edited by Professor A. F. STANLEY KENT, M.A., D.Sc. With 135 illustrations. London: The Library Press, Ltd. Pp. 371. 30*s*.

So excellent a book as this must inevitably be translated sooner or later. The French edition has already been reviewed in THE LANCET[1]; the translation has been admirably carried out by Mr. Bernard Miall, who while retaining the French turn of thought has not failed to write excellent English. The book has been edited by Professor Kent, who in addition to writing an introduction has supplied some useful notes. The shorter hours of work, of which there are now more than indications, render all the more important the organisation of industrial work. This book gives us a timely exposition and criticism of F. W. Taylor's methods of increasing output in factories. Taylor apparently judged the optimum rate of work by means of an instinctive knowledge of the appearances of fatigue acquired as the result of experience; Dr. Amar points out that observations as to the degree of fatigue produced made at a glance cannot replace objective tests and measurements. In the case of work performed by war cripples the physiological limitation of great numbers of persons of this class, the necessity of using them in good earnest, and the social problem created by their employment in industry demand a completer system of scientific control capable of analysing all the factors of human energy.

In addition to describing the methods (derived from the physiological laboratory) by which he investigates fatigue he gives practical directions on such matters as the optimum weight of tools and the best attitudes of the body for particular kinds of work. The book includes the result of his investigations of the scientific principles involved in the construction of artificial limbs. By means of his dynamographic gangway he is able to register all the phases of support and propulsion, the locomotive efforts, and the duration of the elements of activity of the two legs, the normal and the artificial. With the respiration gauge he measures the expenditure involved by walking a given distance with the model under examination, and by these two means is enabled to appraise the relative value of the various makes of artificial legs. The well-known Canet mechanical arm was constructed as the result of investigations carried out under the direction of Dr. Amar. Descriptions are given of several forms of registering apparatus used for the physical re-education of men with arm stumps.

JOURNALS.

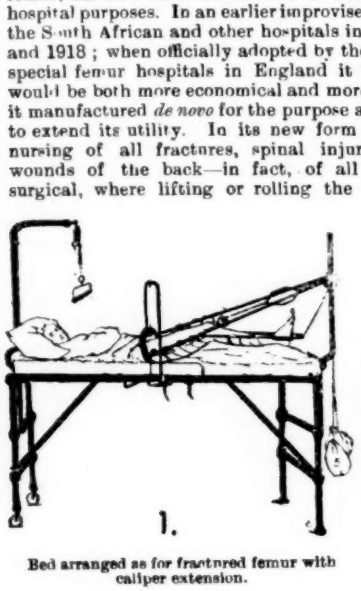
The American Review of Tuberculosis. Baltimore: National Association for the Study and Prevention of Tuberculosis. October, 1918. 35 cents.—Of the five original articles in this number two are devoted to psychic aspects of tuberculosis, three to treatment by artificial pneumothorax. The paper by Dr. Charles L. Minor on "The Psychological Handling of the Tuberculous Patient" is a well written essay on tact and optimism, tempered by judgment, in the treatment of the consumptive. The author illuminates observations perilously akin to platitudes by his facile and sympathetic style. In a paper by Dr. Tohru Ishigami on "The Influence of Psychic Acts on the Progress of Pulmonary Tuberculosis" the opsonic index is used as a guide, and its fall, as a sequel to psychic factors, is taken as evidence of their ill effects. More convincing is the author's observation that psychic acts often cause transient glycosuria. He has found that both sugar and adrenalin inhibit opsonic reaction. His conclusion, based on valuable and evidently laborious research work, that mental overstrain in youth contributes largely to the mortality from tuberculosis will be endorsed by many. The three papers on artificial pneumothorax, by Dr. E. Morris, Dr. S. A. Slater, and Dr. H. F. Gammons, are typical of the mature and deliberate verdict which most American specialists in tuberculosis give in favour of this treatment. The first of these papers deals with as many as 202 cases. The second records a case in which this treatment proved beneficial during pregnancy and labour. The third is a plea for artificial pneumothorax in acute tuberculous pneumonia, a case being recorded in full to point the author's argument.

[1] THE LANCET, 1917, i., 615.

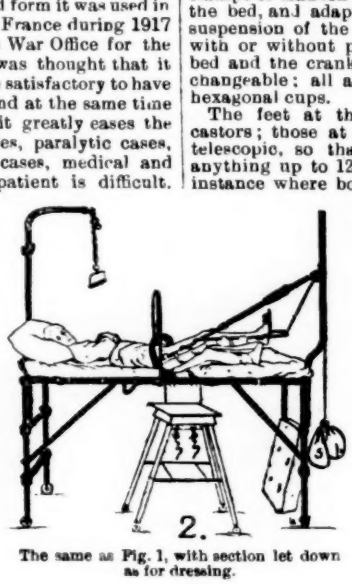
New Inventions.

A BED FOR FRACTURES AND GENERAL HOSPITAL PURPOSES.

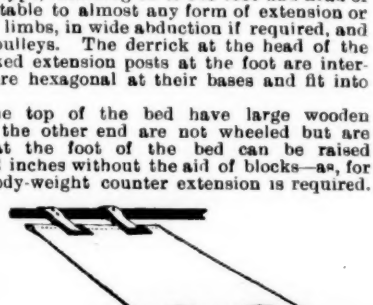
THE bedstead shown in the accompanying illustrations, devised originally for the treatment of gunshot wounds of the femur, has now been modified so as to adapt it for general hospital purposes. In an earlier improvised form it was used in the South African and other hospitals in France during 1917 and 1918; when officially adopted by the War Office for the special femur hospitals in England it was thought that it would be both more economical and more satisfactory to have it manufactured *de novo* for the purpose and at the same time to extend its utility. In its new form it greatly eases the nursing of all fractures, spinal injuries, paralytic cases, wounds of the back—in fact, of all cases, medical and surgical, where lifting or rolling the patient is difficult.



Bed arranged as for fractured femur with caliper extension.

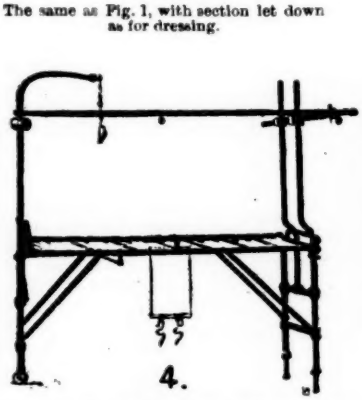


The same as Fig. 1, with section let down as for dressing.

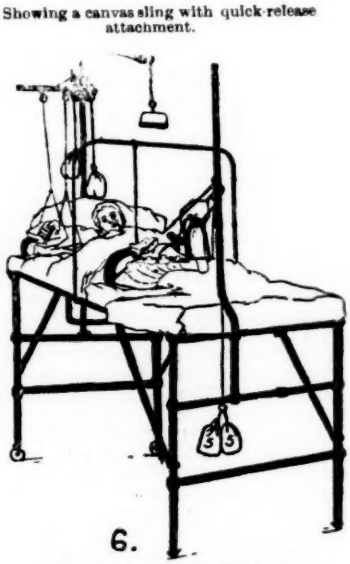


Showing a canvas sling with quick-release attachment.

Bedstead stripped, arranged as for wide abduction of right leg.



The same as Fig. 3, but with overhead suspension equivalent to Balkan beam and with lower end of bed elevated by means of the telescopic legs.



Showing bed arranged as for fracture of right leg and right arm.

Description of the bedstead.—The most evident feature is its height—1 yard—considerably higher than any existing hospital bedstead. At first glance this looks inconveniently high, but after many trials of both higher and lower, experience has shown that this is none too high. Many have been in use during the last year, and the unanimous opinion of nurses, even short nurses, is that the present height of 36 inches is the one that suits them best, and that it saves them a great deal of fatigue in dressing and washing the patient.

The essential feature, however, is not the height but the sectional nature of the whole top of the bed.

The usual spring mattress is replaced by seven transverse slings fastened to one side-bar by flat iron hooks, and to the other by straps and buckles, by which they can always be kept tight. These canvas slings are 11 inches wide, meet edge to edge, and are kept free from wrinkles and quite flat by a strip of metal sewn into each end.

The mattresses which rest on top of them are also sectional, but it is not necessary to have so many; for all ordinary cases we use only one small sectional mattress 11 inches wide, the rest of the bed being covered by two Army "biscuit" mattresses.

For instance, in a femur case the small mattress is put exactly on top of the canvas sling which lies under the thigh, immediately distal to the ring of the Thomas's splint. When dressings are to be done the small mattress and its corresponding canvas are released and dropped, giving free and unimpeded access to the back of the thigh or buttock, so that the wound can be irrigated without lifting the patient or wetting the bedding. Other nursing processes are equally facilitated, and for radiographic purposes one has the great advantage of being able to place the X ray tube below the limb and the screen above with no wire mattress interrupting the view.

Further to ease matters for the nurse, the canvas sling under the wound has a quick-release device shown in Fig. 5, which does away with the need for undoing buckles each time it is used. The movable section with its quick release can, of course, be placed at any part of the bed according to the nature of the wound.

Each bed has with it a supply of tubular fittings and clamps of Maddox type, fastening on to the foot and head of the bed, and adaptable to almost any form of extension or suspension of the limbs, in wide abduction if required, and with or without pulleys. The derrick at the head of the bed and the cranked extension posts at the foot are interchangeable; all are hexagonal at their bases and fit into hexagonal cups.

The feet at the top of the bed have large wooden castors; those at the other end are not wheeled but are telescopic, so that the foot of the bed can be raised anything up to 12 inches without the aid of blocks—as, for instance where body-weight counter extension is required.

Advantages of the bedstead.—To summarise, the chief advantages claimed are:—

1. Nursing and dressing processes made much quicker and easier for the nurse and much less painful for the patient.
2. The patient, bed, and suspension apparatus all together form one self-contained unit, freely movable into the open air if desired as in fire emergencies.
3. No attachments to floor or ceiling, no structural alterations in buildings in order to get overhead suspension.
4. Adaptability to general surgical and medical purposes.
5. The greatest advantage by far is undoubtedly the fact that the patient need never be lifted or moved at all, even for buttock or rectal wounds.

Because of its height the bed is not suitable for convalescent patients who get in and out of bed with difficulty.

I am much indebted to a War Office committee for helpful suggestions regarding the overhead suspension apparatus. The bedstead here described is a War Office issue and is made by Messrs. Whitfields, Ltd., Birmingham.

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THE LANCET.

LONDON: SATURDAY, FEBRUARY 15, 1919.

Medicine, Parliament, and Public.

THE KING'S Speech to Parliament was a dignified yet buoyant recognition that a new era has dawned for the world, while it contained splendid assurances that the aspirations in this country for a better social order will be encouraged by prompt and comprehensive action. Among these assurances the following are second to none in importance:—

"We must stop," he said, "at no sacrifice of interest or prejudice to stamp out unmerited poverty, to diminish unemployment and mitigate its sufferings, to provide decent homes, to improve the nation's health, and to raise the standard of well-being throughout the community. ..... You will be asked to approve a Bill for the creation of a new Ministry to deal with public health, with a view to the establishment throughout the land of a scientific and enlightened health organisation to combat disease and to conserve the vigour of the race."

In direct reply to the speech from the Throne, Dr. CHRISTOPHER ADDISON, President of the Local Government Board, intimated that at an early date he would introduce Bills (1) to establish a Ministry of Health and a Board of Health in England and Wales and in Scotland respectively, to exercise functions connected with health and local government; and (2) to amend the law relating to the housing of the working classes. That one of the principal measures lying immediately ahead of legislation is the institution of a Ministry of Health medical men, in common with the rest of the country, know, but it is not so certain that the country appreciates that the administrative work in connexion with the new bureau will have to be done by doctors, while no general opinion among doctors obtains, or apparently can be obtained, as to what is the right way for the State to avail itself of medical assistance and advice. There is no consensus of view as to how the medical service of the country can be best utilised, and there is no evidence that the country (loudly as it may acclaim the utterance by politicians of such aphorisms as "You cannot have an A 1 country with a C 3 population" or "The nation's soundest asset is sound national health") is prepared to set a high value on the medical work which can turn such aphorisms into practical aspirations. And this fact may embarrass the progress of the Ministry of Health Bill, whose first reading is announced for this week.

A letter which will be found on p. 279 of this issue of THE LANCET goes over old ground, but is of considerable interest because of the unhackneyed way in which a big question is dealt with: and it is a big question, for the author is asking to have a value set upon the worth to the community of its medical service, as a preliminary to urging that proper payment for that service should be made. And he asks the question at a most opportune time. Dr. SPENCE CANDY sums up fairly the unfortunate side of panel practice, and in doing so he shows that the evils displayed are perfectly remediable. The inequalities of earning, the procrastination in payment, and other haphazard features to which he alludes, should all be capable of prompt reform, and it will be the duty of those who lay the foundations of the Ministry of Health to ensure that such defects no longer occur. But their duty will go further than this. They will have to arrange that the whole medical profession of the country, in consolidated and also in detailed manner, is rallied to the task of making the work of the Ministry of Health a national blessing. And they will have to see that, while interpreting the desire of the nation to be made healthy under a Ministry of Health, there is allotted to medical men a responsible share in the work under conditions that are consonant with the position of a learned profession, as well as with the material needs of men who have lain down under much exploitation and who seem everlastingly unable to arrive at common conclusions. How can we obtain an opinion from the medical profession which shall receive such support that the Government, in the planning of the new work, may be sure of our professional coöperation? We know from the public pronouncement made by Dr. ADDISON, then Minister of Reconstruction and now President of the Local Government Board, at a public meeting of the medical profession held in October last, that the Ministry of Health Bill has no lineage derived directly from the medical profession. It is intended to be an assortment of different departmental responsibilities in health matters. What we want to know further is the assortment of responsibilities, opportunities, and returns which has been designed to fit the medical profession as a whole. We need not recapitulate the circumstances which have called for a coördinate arrangement of the duties discharged by six or seven State Departments. All this is familiar to our readers; what we want to know is, how the medical profession—the general practitioner, the consultant, the specialist, and the pathologist, the consulting-room, the laboratory, and the institution—can be fitted into the picture. Assuming that a complete regimented State Service is not and cannot be intended, at any rate for the present, there remain several schemes before the profession which have many points in common. Two of these, as well as the scheme emanating from the British Medical Association, have been published at length, one by Major J. F. GORDON DILL, senior physician to the Sussex County Hospital, and one by Major-General Sir BERTRAND DAWSON. Major DILL'S scheme is for the establishment of a State Service of Medicine alongside of which there would run all opportunities for private practice with some openings for personal initiative and for success in accordance with special characteristics or with the display of individual talents. Under his scheme the detailed

work of any new medical bureau would be discharged by medical men where medical details touched the life of the people. In other directions Sir BERTRAND DAWSON'S scheme is full of valuable promise, for it would give scope for centralising, around county hospitals as a focus, the clinical and scientific practice of all large centres of population in the country. Thus immediately the general practitioner would be brought into touch with the specialist and the pathologist, while the officials of the new Ministry of Health would enter upon a real union with their unofficial professional brethren. We want now a common expression of opinion upon these and analogous schemes, so that progress may be made along accepted lines.

But how difficult this is to arrive at we see on every side. The Ministry of Health will affirm the principle of a State Service of Medicine by taking over the work of the National Insurance Commission, which has for its charge the care in sickness of some 14 million subscribers; and which provides work of the most strenuous sort for a large proportion of the effective medical profession upon terms that are not satisfactory to many of those who have to do the work. Some appear to be perfectly satisfied with the existing conditions, some wish to have them reformed in certain definite directions, and to some panel practice is a deadly sin. Again, to nationalise the hospitals is for some the beginning of reform, and to others simply anathema. These are not easy circumstances in which to arrive at a consensus of opinion. For our part, we hold that professional differences have been exaggerated. We do not believe that there need be irreconcilables, but we are certain that there will be unless the general plan of the Ministry of Health is laid down with anxious regard as to what is due to the medical profession. For we must be the executive of the Act, whatever Act emerges. We know that in the existing Bill provision is made for the institution of Consultative Councils, and if the functions of these Councils are well defined—in other words, if the personnels are carefully chosen—and if the public is made immediately and clearly aware of the reasons which determine State action on medical grounds, these Councils will be a power for good; but it is absolutely necessary that the Councils should themselves be able to ascertain the views of the medical profession as a whole, and the reasons of general justice and particular wisdom on which they are based. Dr. ADDISON, at a dinner given by the Medical Parliamentary Committee to the medical Members of Parliament on Wednesday last, declared his intention of making these Councils "*bonâ-fide* bodies, real and hard working," and it is the aspiration of the Medical Parliamentary Committee to place the medical profession in close touch alike with the work of the Consultative Councils and with the medical Members of Parliament. At the same dinner a statement of the aims before the Medical Parliamentary Committee was made, showing its wide constitution and affirming its hope that from a scheme, which it is preparing for submission to the medical profession, a representative body may emerge, neither committed to the support of, nor inimical to, any professional sections, but rather striving to provide a Round Table at which these sections can thrash out their differences.

Annotations.

"Ne quid nimis."

THE DEVELOPMENT OF POST-GRADUATE FACILITIES.

WE announced recently that the Inter-Allied Fellowship of Medicine had arranged with different medical schools in London for emergency post-graduate courses to which men from the services, the Dominions, United States, and our Allies would be welcomed. We remind our readers that tickets for the course, at the rate of £3 10s. for each month, can now be obtained from the secretary of the Fellowship at the House of the Royal Society of Medicine, to which the Fellowship has been given access.

Alongside of this development of post-graduate activity the usual post-graduate courses in London will soon commence, and the course in connexion with the West London Hospital, Hammersmith, is now announced. A special eight weeks' course will be held at this hospital, beginning on Monday next, Feb. 17th. The fee for the course is 5 guineas, and in return the subscribers can attend clinics during the afternoons of five days of the week, including a venereal diseases clinic, and can also be present at operations and at demonstrations in the wards. Classes in all the usual medical and surgical specialties will be arranged in accordance with the entrances, and in return for special fees. Further particulars of the course will be found in our weekly diary.

Our Edinburgh Correspondent sends us the following information with regard to post-graduate teaching in Edinburgh, so that in the Scottish capital a similar determination to develop the post-graduate side of instruction has been arrived at.

The Executive Committee of the Edinburgh Post-Graduate Courses have resumed their activities, which have been suspended since 1914 owing to a large proportion of the teachers having been engaged in war work. In reorganising the courses the committee have kept in mind the need for meeting the immediate requirements of graduates who have for some years been out of touch with civilian practice, particularly of those who proceeded to work in the services as soon as they had obtained their degrees. Many of these men, before entering upon the careers they had proposed to follow but for the war, will desire to revive the knowledge of those branches of practice which have been in abeyance while they have been engaged with the Navy or the Army. To meet this demand the committee have arranged to hold during each academic term a course in clinical medicine and a course in clinical surgery, and during the months of August and September a course in obstetrics, gynæcology, and child-welfare. The instruction will be largely practical, the members of the courses taking part in the clinical work in the wards of the Royal Infirmary, Royal Hospital for Sick Children, Royal Maternity Hospital, and of other institutions. Arrangements have also been made by which practical work will be conducted in the anatomical, physiological, pathological, and bacteriological departments. A series of lecture-demonstrations will be held in each subject in addition. The classes are open to women graduates. The courses are conducted under the ægis of the University and the Royal Colleges. Mr. Alexander Miles, F.R.C.S., is acting as interim honorary secretary.

We learn also from our Paris Correspondent that courses of study are being arranged by the Faculty of Medicine in Paris specially designed for doctors and students of Allied and neutral countries. Professor F. de Lapersonne will conduct a course of ten lessons on Orbito-ocular Surgery, limited to 30 students, in the Amphithéâtre Dupuytren (Hôtel-Dieu), on Tuesdays, Thursdays, and Saturdays, at 4 P.M., beginning March 11th. On May 6th will commence a finishing course in Ophthalmology, including clinical, operative, and pathological work.

conducted by Professor Lapersonne, with the assistance of Professor Terrien and Dr. Velter, director of the laboratory. The fee for the first course is 50 francs and for the second 100 francs, and at the conclusion of each a certificate is granted.

NEW HUNTERIANA.

Professor A. Keith, in his recent Hunterian lectures on "Phases in the Life and Work of John Hunter," has undoubtedly succeeded in throwing a flood of light on the early life of the great surgeon, whom he compares to Shakespeare, Newton, and Aristotle. John Hunter was one of the world's outstanding geniuses, and research such as Professor Keith's continues to add to his lustre. Yet despite all this, in many particulars John Hunter's personality remains dim to us, and even when new facts come to light we are often left wondering how he looked and acted among contemporaries. Thus a new glimpse of Hunter afforded in the second series of the William Hickey Memoirs recently published, leaves us with but a shadowy impression. Mr. Hickey, that delightful *bon vivant*, got very tipsy, as was his wont, at the house of his ultra-hospitable friend, Mr. Crane, of Margate, in or about the year 1780. He played cards with his friends, but went to doze off the fumes of wine in front of a roaring fire. He awoke in excruciating pain and was found to be suffering from a burnt foot. The burn had gone clean through a thick "wax leather" boot. The Margate surgeon, who was at once sent for, prophesied life-long lameness for poor Mr. Hickey on the ground that some of the large vessels of the foot appeared "materially hurt." Mr. Robin Adair was then summoned in consultation from London, but as he was out of town and Mr. John Hunter had "undertaken to act" during his absence the latter came down to Margate. "After meeting the Margate surgeon and inspecting my foot," says Hickey, Hunter "at once declared no ill-consequences would arise, and that a few days' quiet, keeping my leg in a horizontal position, and frequently applying an embrocation which he ordered, would completely cure the hurt, and so it proved." It is a pity that the garrulous Hickey, who has recorded such vivid impressions of nabobs and others once famous, should have left us so much in the dark as to details of John Hunter's manner, mode of address, speech, and so forth.

We gain no clearer picture from Peter Pindar, who in 1788 echoed the public's dislike of scientific discovery in some mordant lines descriptive of various leaders of the Royal Society. The satire in which the lines occur is the well-known "Peter's Prophecy: or, the President and Poet." It takes the form of a dialogue, with notes, between Sir Joseph Banks and Peter Pindar (Dr. John Wolcot):—

Sir Joseph:
Hunter with fish intrigues our House regales—
Peter:
The tender history of cooing whales!
Sir Joseph:
Great in the noble art of gelding sows!—
Peter:
And giving to the boar a barren spouse!
Who proves, what many unbelievers shocks,
That age converts hen partridges to cocks!
And why not, since it is deny'd by no man
That age hath made John Hunter an OLD WOMAN?
Believe me, full as well might Papists bring
Quills from a Seraph's tail, or Cherub's wing:

. . . . . .

Or bones from Catacombs to form new saints,
To cure, like all quack medicines, all complaints!
Such might the journals of the House record,
As well as Hunter's wondrous *cock-hen bird!*

Dr. Wolcot, the son and grandson of surgeons, and himself for many years a practising physician at Truro, previously to which period he had been Physician-General to the forces in Jamaica, was well acquainted with the movements of science. Hence his rage against John Hunter must be attributed to political bias and to his violent dislike of authority, especially as embodied in the Royal Society and Royal Academy, which latter corporation in his capacity as art critic he also skitted mercilessly. But we could wish that Peter Pindar had left us a portrait of Hunter as a man similar to his comic satiric impressions of the personalities of George III. or Banks. The King, according to Hazlitt, greatly enjoyed Pindar's terrible attentions and even proposed to pension him! Hunter's rugged sense of humour should have appealed to Pindar at all times, but Pindar refuses to describe him. There is, indeed, in Hunter's case the same careless or unpremeditated conspiracy of silence of which we complain in that of Shakespeare. Of John Hunter, Matthew Arnold might have sung, as he did of Shakespeare:—

> "Others abide our question. Thou art free.
> We ask and ask—Thou smilest and art still,
> Out-topping knowledge."

We look in vain in Mrs. Chapone's, Mrs. Montagu's, or Horace Walpole's letters, or in Boswell's pages, for a pen-portrait of John Hunter or even for an allusion to him, and, finding none, we are driven to conclude that for the majority of the diarists and chronographers of his day he stood "on earth unguess'd at."

THE PHYSICS OF SHOCK.

PHYSIOLOGISTS are apt to complain that their teaching takes a generation to percolate down to actual medical practice, or, in other words, that little or no use is made of experimental research until the students to whom it is imparted become the well-established medical practitioner. Some lag is inevitable, but the complaint in its extreme form is already out of date, for the physicist is already having the chief say in one of the most frequent and urgent circulatory disorders—namely, secondary shock. The discussion at the Royal Society of Medicine, of which we give a full report on another page, leaves barely a doubt that the most important factor in the shock which follows severe injury or surgical operation is not exhaustion of nerve centres, suprarenal deficiency, inefficient cardiac contraction, or acidosis—is not even loss of vascular tone, although any or all of these things may play their part: it is simply the small volume of fluid in effective circulation. The vascular tree is underfilled and oxygen no longer is distributed to the tissues in proper quantity. Granted this postulate, the corollary at once follows that some means is required of bringing up the volume again to the required level. Warm physiological saline solution may be used, but in half an hour it has passed through the capillary walls, and the condition is the same as it was. Thus far the surgeon. The physicist then whispered to him: "I can tell you of a fluid which, if you put it inside a vein, will not come out again. Try a solution of some colloid with molecules so big that the capillaries will not let them through their walls." Gelatine was first tried and given up on the purely accidental ground that, prepared as it commonly is from calves' feet, it was apt to contain tetanus spores. The physicist then suggested gum, a substance

easy to obtain and to sterilise, adding that in 6 per cent. solution gum not only possessed the same viscosity as blood but also the same osmotic pressure, or, in other words, this gummy solution introduced into a vein neither impedes the circulation nor has any tendency to leave the vessels. Clinical evidence has now abundantly confirmed the fact that three-quarters of a litre of a 6 per cent. solution of pure gum arabic injected at body temperature into a vein is far and away the most potent agent in dealing with secondary shock. Its use is not necessarily confined to surgical cases. We have just received from Sir Leonard Rogers the text of his presidential address delivered last month before the Indian Science Congress at Bombay. Since 1895 he has sought to overcome the collapse stage in cholera by injecting various fluids. Beginning with normal saline subcutaneously and per rectum, he went on to give the same fluid intravenously, he then increased the percentage of salt, and finally added permanganate and alkali to the hypertonic salt solution. In so doing the proportion of recovery rose at each stage, starting from 41 per cent. and going on through 49, 67, and 74 to the high figure of 81 per cent. in the period 1915 to 1917. We can hardly be wrong in expressing the hope that here also a gummy solution may attain even better results. The whole literature of the subject may be found in Professor W. M. Bayliss's Oliver-Sharpey Lectures recently published[1] in book form.

WHISKY AND WATER.

SOME years ago there was considerable discussion as to what constituted the injurious secondary products in potable spirits in general, and in whisky in particular. The popular notion used to be that fusel oil was a source of headache from whisky drinking. Chemists improved the occasion by suggesting that amongst the toxic products occurring in malt whisky were aldehydes, certain oils, and bases more or less eliminated by maturing. The order of the Liquor Control Board to the effect that no whisky is allowed to be sold at a greater strength than 30° under proof seems to have suggested a new light on the question. Whisky was formerly supplied at a strength of about 17° under proof (approximately 48 per cent. by volume of alcohol), whereas at 30° under proof the alcoholic strength by volume is about 40 per cent. Grain spirit stands this dilution without turning appreciably opalescent, but malt whiskies and blends get turbid, and so filtering has to be resorted to before bottling the spirit. This turbidity is due to certain oils and other substances derived from the malt in distillation, which are soluble in the old strength of spirit, but insoluble in that now supplied. There are, therefore, absent in whisky as it is now provided certain bodies removed by dilution and filtration which were present in the pre-war spirit. The outcome is that the whisky of to-day keeps bright in the glass on dilution with water, with results, it is probable, that are all the better for the consumer. The interesting question remains, What is the nature of the constituents causing the opalescence produced by dilution and removed on filtration? The present circumstances offer opportunity for determining this point, for there must be an accumulation of this material in the filters used by the whisky dealers. Those who are interested in the chemistry of whisky might well investigate the question with a view of throwing a light on the nature of these materials and of determining their physiological action. Such an inquiry might settle old vexed questions as to the toxic bodies in whisky, other than alcohol. Diluted whisky, subsequently filtered from the opalescence which forms, is thought to be more wholesome (if that word can be applied to the drinking of spirits at all); this belief may find scientific explanation when the substances which cause this opalescence have been investigated. Or does the fact that less alcohol is being consumed in the whisky of to-day account by itself for the increased wholesomeness?

[1] Intravenous Injection in Wound Shock. London: Longmans, Green and Co. 1918. Pp. 172. 9s.

SOCIAL EVENINGS AT THE ROYAL SOCIETY OF MEDICINE.

IN spite of the unfriendly meteorological conditions and the failure of transport facilities, the first social evening held at the house of the Royal Society of Medicine on Wednesday, Feb. 5th, was the unqualified success of a function attended only by those who wanted to be there. Sir John Bland-Sutton gave the discourse on Gizzards which we printed last week, and he afterwards demonstrated specimens with much humorous detail. The Library was open for informal discussions, and a number of Dominion medical officers were present. During the evening two noteworthy cinema films were thrown on the screen, the first showing the circulation as a going concern, the corpuscles traversing the capillary network in the frog's lung being specially effective. The second film depicted every stage in the inoculation of a rabbit with the *Spirochæta pallida* and the cure with salvarsan injection. The spirochætes were well seen in movement on the screen under dark-ground illumination.

An attractive series of discourses is announced on successive Wednesdays at 8.30 P.M. at the Social Evenings. Sir Arbuthnot Lane took Stasis as his subject this week. Next week Dr. Norman Moore will deal with English Morbid Anatomists. In the weeks that follow Sir William Osler will discourse on Sir Thomas Browne, Dr. Henry Head on Disease and Diagnosis, Mr. W. G. Spencer on Larrey and War Surgery. A cordial invitation to attend these Social Evenings is extended to medical officers of the various services, and especially to those from the Dominions, the United States, and Allied countries temporarily in this country.

WORDS CAUSING PHYSICAL INJURY.

JUDGMENT was delivered recently by Mr. Justice Avory in the case of Janvier *v.* Sweeney and Barker. The plaintiff, a Frenchwoman, claimed damages for nervous shock and injury to her health caused by certain statements made to her by the defendant Barker, assistant to the defendant Sweeney, a private inquiry agent. The plaintiff's case was that Barker, in order to obtain through her intervention certain letters written by a deceased officer to a lady living where Miss Janvier resided, told the latter that he was a police officer and that she had been corresponding with a German spy, and that the fright and agitation resulting from this accusation had made her ill. The jury, in answer to questions put to them, found that Barker had used the words imputed to him, that they were calculated to

cause physical injury to the plaintiff, that they were made maliciously, and that the plaintiff had been made ill by them. Damages of £250 were awarded. Argument took place as to whether as a matter of law words, even when causing physical injury, could be actionable, except in the case of defamation, and whether there was evidence justifying the jury in finding that the injury suffered by the plaintiff was the result of the statements above referred to. Mr. Justice Avory held with regard to the first point that false statements, if they cause physical harm, afford ground for an action at law in respect of such harm, and gave judgment in her favour against both defendants for the damages above mentioned. In view of an appeal a stay of execution was granted.

LARYNGO-FISSURE AND CANCER OF THE LARYNX.

THE history of the operation of laryngo-fissure is interesting. Originally suggested by Desault in 1812, it was performed for the first time by Brauers, of Louvain, in 1833, for a papillomatous growth. This operation was carried out without an anæsthetic, without a preliminary tracheotomy, and before the days of laryngoscopy—a bold and brilliant performance. The first record of a laryngo-fissure for a malignant growth, and with the protection of a tracheotomy, is that of Gordon Buck, of New York, in 1851. But for the eradication of cancer it failed at first to succeed. In his first 8 cases even a great surgeon like Billroth had 6 recurrences. Morell Mackenzie condemned it. Paul Bruns recorded 19 cases, of which only 2 survived a year, and concluded, in 1878, that "the attempt at radical extirpation of cancer by means of thyrotomy had proved itself completely unsatisfactory and worthless." A curious and interesting part of the history of this operation is that three of the pioneers in establishing it were at first very hopeless about it. In 1883 Butlin wrote that "the disease is far too deeply seated to admit of removal by so slight an operation"; as late as 1886—only 33 years ago—Semon formed the opinion that it should not be attempted; and Moure (of Bordeaux) concluded that thyrotomy appeared a bad operation in established laryngeal cancer. This was in 1891, and yet, before the century finished, laryngo-fissure had given results which rivalled those for cancer in any other part of the body. Professor Schmiegelow of Copenhagen (another of the pioneers of this subject), stated in our columns on August 1st, 1914, that "the whole of our present knowledge of the diagnosis and treatment of this disease is founded on the work of Semon and Butlin, who, towards the end of the last century, entirely revolutionised our views with regard to the malignancy of intralaryngeal cancer."

How well this revolution has been consolidated can be seen by reference to the paper on Intrinsic Cancer of the Larynx read at the Medical Society of London (see p. 263) by Sir StClair Thomson. He produces evidence to confirm his conclusion that if patients applied early with epithelioma limited to a vocal cord and are operated on by laryngo-fissure, then the death-rate should be nil, the restoration of voice satisfactory, and the cure lasting. This remarkable change in 30 years has been achieved by improved skill in early diagnosis, and increased perfection in surgical technique, and both of these are the result of such cases being handled by expert laryngologists. Further, the study of Sir StClair Thomson's account of his cases suggests that from such work we obtain help in elucidating the wide subject of the whole etiology of cancer. Recurrences are dealt with. A cancer may appear in the same side of the larynx 5 to 15 years after a laryngo-fissure. Or that side of the larynx may remain healthy and an epithelioma may start in the opposite cord 13 years later. Or it may show on the opposite side of the tongue 3 years later. Or the larynx may remain quite free from disease and yet the patient may die from cancer of the stomach 8 years after a laryngo-fissure, or from cancer of the rectum 18 years after a successful operation for the same disease in the larynx. Can these be called "recurrences"? Are these not entirely fresh new growths? What is their connexion, if any, with the original vocal cord cancer? What is this tendency to cancer? These histories should stimulate our scientific imagination to new researches. Anyhow, the operation of laryngo-fissure for intrinsic cancer of the larynx, which was condemned by some of its own pioneers 33 years ago, has since achieved such successes that, as Chevalier Jackson says, "nowhere in the whole realm of the surgery of malignant diseases have such results been obtained."

THE COLLEGE OF AMBULANCE AND THE FUTURE OF THE V.A.D.

LAST year[1] we endorsed the appeal of Sir Rickman Godlee and Sir James Cantlie, the President and Principal respectively of the College of Ambulance, Vere street, W., for funds in order that the College might have an assured income and be enabled to carry out in peace-time the immeasurably useful work which it has done during the war. As we then pointed out, there are many ways in which the College can help to preserve human life. One of these ways was admirably demonstrated on Saturday last, when the County Director, Lieutenant-Colonel J. F. Badeley, paid an official visit of inspection to the College. Sir James Cantlie gave a demonstration—in reality a repetition on an enlarged scale of that which was given in May last[2]—illustrating the means by which improvised methods of first-aid might be successfully applied to accidents on the farm. The keynote of the method was simplicity and the adaptation of materials at hand for stretchers, splints, and dressings. Colonel Badeley said that up to Dec. 1st, 1918, there were 1168 Red Cross hospitals and 245 hospitals under the control of the Order of St. John. The Voluntary Aid Detachments controlled by these two organisations numbered 3138 and 985 respectively, the total personnel being nearly 300,000. Although the Red Cross Society had accomplished the work for which it had been called into existence, it would be impossible to revert to a pre-war footing. In addition, the voluntary workers desired in some way to continue their services to the country for which they had been trained. For this purpose he suggested that the charter of the British Red Cross Society should be enlarged in such a way that the organisation might undertake welfare work. This, he said, would demand a corps of trained workers, together with a body of part-timers, who would find employment under the various care committees now in existence or about to be formed, and in other ways. Some V.A.D. workers could be trained for the higher technical posts of inspectors of factories, health visitors, &c.; there would be welfare secretaries at headquarters and a secretary

[1] THE LANCET, Dec 14th, 1918, p. 823.
[2] THE LANCET, May 25th, 1918, p. 758.

in each borough, who would attend to requisitions from the local workers. The men's V.A.D. might form a brigade to be available for epidemics, accidents, and on ceremonial occasions. Colonel Badeley concluded by stating that the ingenious display which Sir James Cantlie had provided should be seen by everyone throughout the country.

CLINICAL MEETING OF THE BRITISH MEDICAL ASSOCIATION.

THE special clinical meeting of the British Medical Association has now been fixed for four days, Tuesday, April 8th, to Friday, 11th, and a provisional programme has been drawn up. The meeting will divide into three sections: medicine, surgery, and preventive medicine with pathology—the three to run concurrently. In the section of medicine, influenza, venereal disease, and prognosis in cardio-vascular affections will be the principal subjects discussed. In the section of surgery, gunshot wounds of the chest, wound shock, and reconstructive surgery take the premier position. Influenza also figures in the section of pathology along with the dysenteries and malaria. Demonstrations in all the three sections cover a wider field and include a time-table of visits to general and special hospitals. The war collection of pathological specimens at the Royal College of Surgeons will be on view daily during the meeting from 10 to 6.

THE FUTURE OF WESTMINSTER HOSPITAL.

WE understand that at a meeting of the Governors of Westminster Hospital next week a resolution will be considered recommending amalgamation with King's College Hospital, the reasonable reservation being added that the name, identity, and traditions of the Westminster Hospital shall be fully and permanently preserved in the combined institution. The resolution, it will be seen, puts in a sentence the result of long negotiations. Eight years ago the principle of removal was adopted at a meeting of the Governors of Westminster Hospital, when under a provisional scheme a site at Clapham came under consideration and was eventually purchased, a proposal for amalgamation with St. George's Hospital having broken down. The altered conditions of finance and labour brought about by the war led, however, to a reconsideration of the intention to migrate to Clapham, with the result that on the one hand many objections were raised to the rebuilding of the institution upon the site at Clapham, while strong arguments were found for amalgamation with King's College Hospital. The main objections to the Clapham scheme are: (1) that the site is not completely ready, inasmuch as various purchases of adjacent properties remain to be made, and (2) that the cost of labour and materials, already excessive, would make it imprudent to expend the greater proportion of the available capital in building a small hospital—for the Clapham project had in view a hospital of only 300 beds. There are, moreover, at Clapham voluntary institutions meeting the urgent needs of the immediate neighbourhood. The arguments in favour of amalgamation with King's College Hospital meet the objections to the Clapham scheme. An amalgamation with King's College Hospital will result in the transformation of two institutions, neither of which is wealthy, into a single first-class modern hospital, and it is agreed on all hands that no new hospital with an attached medical school should be built in the metropolis, having less than 500 beds. King's College Hospital is already installed in part of its new buildings at Denmark Hill and by amalgamation with Westminster Hospital these buildings can be completed and extended to the full dimensions of a first-rate teaching institution. And perhaps the strongest argument of all in favour of a junction of forces between Westminster Hospital and King's College Hospital is that in this manner a really strong medical school would be secured. The prospects of a medical school attached to Westminster Hospital as an institution of 300 beds on Clapham Common must be regarded as very unfavourable. By joining forces with the medical school of King's College Hospital a large school should soon arise affiliated to a first-class modern institution.

PERFORATION IN CANCER OF THE STOMACH.

WHILE perforation is common in gastric ulcer it is very rare in gastric cancer. Writers give statistics varying from about 2·5 to 6 per cent. of the cases. In the *American Journal of the Medical Sciences* for January Dr. J. Friedenwald and Dr. A. McGlennan have published an important paper on the subject. In a series of 1000 cases of cancer of the stomach there were only 23 cases with signs of perforation, and in only three of these was perforation demonstrated. The process of ulceration is slow, allowing time for the development of adhesions which wall off the general peritoneal cavity, so that perforation occurs into a protected cavity and a chronic abscess is produced. The following is an example:—

An emaciated negro, aged 53 years, was admitted into hospital with a nodulated mass below the right costal margin. He had suffered from nausea and vomiting for three months. To the left of the middle line and above the umbilicus was the scar of an operation, at the lower end of which was a gastric fistula, through which milk was discharged in a curdled state about an hour after ingestion. Carcinoma with perforation of the stomach was diagnosed. After three days the patient died from exhaustion. At the necropsy carcinoma of the pylorus with metastases was found. The fistula passed from the stomach through the cancerous mass to the abdominal wall.

Acute perforation may occur in gastric cancer. The following is an example:—

On August 3rd, 1908, a woman, aged 62 years, sought advice for indigeston of three months' duration. There were nausea, occasional vomiting, and gastric pain not related to the taking of food. A hard mass was felt at the centre of the epigastrium. Operation showed a carcinomatous mass involving the pylorus and nearly half of the body of the stomach. On account of metastases in the mesenteric glands and liver no attempt at excision was made. Gastro-enterostomy was performed. The patient was able to take nourishment better for a time. On Dec. 10th she was seized with intense abdominal pain, which was followed by symptoms of shock—rapid pulse, clammy extremities, and cold perspiration. She died within a few hours. The necropsy showed a large perforation in the middle of the cancerous mass at the pylorus. The gastro-enterostomy opening was patent.

Sir Anthony Bowlby delivers the Hunterian Oration on British Military Surgery in the Time of Hunter and in the Great War at the Royal College of Surgeons of England to-day (Friday), being the anniversary of Hunter's birth.

THE Arris and Gale lectures are to be delivered at the Royal College of Surgeons of England by Mr. Edred M. Corner on Feb. 19th and Mr. E. M. Cowell, Lieutenant-Colonel, R.A.M.C., on Feb. 21st, at 5 P.M. Mr. Corner has chosen as his subject the Nature of Scar Tissue and Painful Amputation Stumps. Mr. Cowell will deal with the Initiation of Wound Shock and its Relation to Surgical Shock.

BIOLOGY AND THE MEDICAL CURRICULUM.

By T. G. HILL,
READER IN PLANT PHYSIOLOGY, UNIVERSITY OF LONDON, UNIVERSITY COLLEGE.

ALL licensing bodies wisely require a medical student to pass an elementary test in biology (or botany and zoology), chemistry, and physics before permitting him to take his examination in anatomy, physiology, and pharmacy. For very many years botany has been taught to medical students since, in the past, it has been of direct importance. Zoology was introduced later in order to provide a knowledge of the methods of anatomy and to form an introduction to the detailed anatomical study of the human being.

The direct value of botany for the most part has disappeared at the present time, and, in view of the changes proposed in the teaching of botany to elementary students, the present is a convenient opportunity for raising certain questions regarding the instruction of medical students in biology.

Deficiencies in Organisation and Teaching.

It will be generally conceded that biology has a high educative value and also is the obvious means of providing a preliminary training in the methods and technique which form so important a part in the student's future work. At the present time instruction in botany and zoology is given in the Universities by the staffs of the two departments, so that a medical student attends lectures and practical classes in botany and zoology, the two subjects being, in the majority of cases, uncoördinated. In the larger medical schools, on the other hand, there is usually a lecturer on biology who instructs in both branches of his science; the student at the medical school, therefore, has the advantage, but not infrequently the teacher is under the disadvantage of having fewer facilities for teaching. It is not the present intention, however, to deal with medical schools in particular; but, from wide personal experience as a teacher under both systems, to point out some of the more outstanding deficiencies which obtain in organisation and teaching.

Since medical science is a branch of biology the importance of general biology—not botany and zoology as such, but a general introduction to the knowledge and study of life and an education in the methods of biological work—in the preliminary medical sciences cannot be over-estimated. The exact amount of actual knowledge gained by the student is immaterial provided he thoroughly understands what he knows and is able to apply the principles learned. In a phrase, education rather than mere information. This is, of course, realised; vividly by some, dimly by others, and efforts have been made to bring the more ideal state of affairs into being. For example, in the first examination for medical degrees in the University of London, which replaced the older Preliminary Medical Examination, the syllabus has been much cut down and, instead of separate examinations in botany and zoology, papers are set in general biology. The success of these experiments has not been conspicuous, nor will be until certain reforms are carried out.

Suggested Reforms.

The first reform is that the medical students must have a special course of instruction, not a bowdlerised edition of the instruction given to students in the Faculty of Science. This course must be general biology treated as one subject; it should not be resolved into its components botany and zoology. Clearly this is not possible unless the instruction be given by a professor or a lecturer, with an adequate staff, who must be held entirely responsible. In other words, he must be independent of other departments of biology; he should be of the Faculty of Medicine rather than of the Faculty of Science.

It may be argued that it will prove a very difficult matter to find teachers of any standing to undertake the work and that, nowadays, no biologist has the time to keep abreast of the details of botanical and zoological research, and so on. These are but minor difficulties. When it is understood that there is a high and worthy object in view, the proper people will be forthcoming, provided the terms of appointment are attractive; it is, for example, an anomaly that the lecturer on biology in a medical school should be paid a much lesser salary than the lecturer in chemistry. Other difficulties would speedily disappear if the right candidate were selected.

The medical student must be taught the principles of biology. Morphology, for example, must be thoroughly understood; this does not necessitate a large selection of types, the average syllabus contains quite as much material as is requisite. Physiology is most important, and every advantage should be taken of plants simply because the main vital functions can be more easily demonstrated with plants than with animals. Further, it is all-important that the study of function should go hand-in-hand with structure. The medical man must in practice always associate function and structure, and the sooner this habit of mind is formed the better. As it is, the relegation of physiology to a week or so at the end of the course is all but valueless in training.

With regard to practical work, it is to be remembered that in addition to mental education, the education of the hand and the eye is all-important. A high degree of skill in dissection and in the preparation of objects for microscopic examination should be insisted upon. A student should be absolutely at home with the microscope and should be able to use the microtome. All should be able to write a description of a preparation or other object in clear and simple language and illustrated by clear and accurate sketches.

It does not always appear to be realised what parts of the subject are of direct value to the student in his subsequent studies. To take an example: much too little attention is paid to fundamental facts of the anatomy of plants. Sections of stems, roots, and leaves are all very well, but are of no value without a knowledge of the actual tissue elements. The study of macerated material, judging from examination results, would appear to be dying out. I remember being asked by a pathologist, a very highly qualified man, to examine some milk films, as they showed curious bodies which he had never before seen. These bodies were nothing more than lignified vegetable débris—cell walls, protoxylem rings and spirals; in brief, the milk was contaminated from an obvious source.

With respect to physiology, there is reason to suspect that in many cases the apparatus is put up and the experiments performed by a demonstrator. This is quite wrong, students should themselves set up their experiments as far as is possible and should invariably perform them. Further, the reason for all negative or peculiar results should be ascertained. A few carefully selected experiments actually set up and observations made by the students themselves are worth hundreds of demonstrations performed by the teacher. In other words, the teacher should act in an advisory capacity.

It is not infrequently stated that no reform can be made owing to the examination system; if this be so, the sooner the system be reformed the better. Examiners are to ascertain what a candidate knows and what he can do, and whether he has a sufficient equipment to proceed with his studies. If examiners gave more credit for the practical examinations and less for the theoretical a great improvement would very quickly result, especially in a subject like general biology, where the number of possible questions for the written papers, as judged by the published papers, appears to be limited.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Proposal for a Central Health Department.

THE Commission of Hygiene of the Chamber has adopted a report drawn up by Dr. Navarre in favour of the formation of a Ministry of Public Health, under the direction of which would be placed all the health services, both civil and military, of relief and public hygiene. The idea is not a new one, having been advanced by a number of deputies more or less suspect of coveting the post of executive officer. Possible occupants of the post are, indeed, numerous. The present medical staff is not unfavourable to the idea in view of the fact that the various services of hygiene are distributed among all the Ministries, each occupying a subordinate position without right of initiative or liberty of action. At the Ministry of the

Interior there now exists the important directorate of hygiene and of public relief, both these services being under the same administration; and this is a fundamental mistake, for many questions of relief are unconnected with hygiene and are more often closely related to finance and especially, unfortunately, to party politics. The most serious fault of the present system is that it entrusts the carrying out of hygienic measures to the usual agents of the Ministry of the Interior, the mayors and the prefects. The former dare not apply the penalties of the law to infringements committed by their electors in order not to displease them; the prefects are prone to the same indulgence, also for political reasons, while the deputy of the department intervenes in favour of his own faithful electors. I have known the closing of an oyster bed, known to be contaminated by a leaky sewer, deferred so as not to influence the district unfavourably on the eve of an election. So long as hygiene is left to the Ministry of the Interior it will not be applied in the face of the formidable political influence ruling there. The teaching of medicine and of hygiene is in the hands of the Minister of Education, as also are school hygiene and physical culture. Food hygiene and the supervision of the control of qualities of foodstuffs which are injurious to health belong to the Minister of Commerce. International sanitary conventions and the organisation of the struggle against pandemics occurring in different countries are in the domain of the Minister of Foreign Affairs. The question of wines, alcohol, tobacco, where hygiene is involved, the hygiene of the State manufactures, appertains to the Minister of Finance. The hygiene of the railways and the disinfection of carriages belong to the Minister of Public Works. Accidents occurring in industrial life are in the purview of the Minister of Labour. Medical jurisprudence is under the Minister of Justice. Finally, the Minister of War and the Minister of Marine have each their special State service. Obvious inconveniences result from this dispersion of effort. Two of these are: a personnel too numerous and often incompetent; undue delay in the solution of problems which, as often happens, concern many Ministers at the same time. It is this administrative anarchy which it is proposed to end by the creation of a single Ministry to centralise the scattered services, of which the chief alone would retain the right of being consulted when a question of hygiene arose which concerned him. The Ministry of Public Health, when set up, would have the power of carrying out its decisions by its own agents, all recruited from among those who are both competent and well-fitted for their particular mission. Recently a press campaign has been conducted demanding the creation of this new ministry, and suggesting handing over to it as a nucleus the Under-Secretariat of Hygiene created since the war at the Ministry of War. A first indication in this direction lies in the fact that it is this particular Under Secretary who has introduced to the new Chamber the Bill aiming at official organisation of the anti-tuberculosis campaign.

Hygiene and the Frenchman's House as His Castle.

The Council of State has just given an important decision on a hygienic matter in which doubt arose in the interpretation of the law declaring a private house to be inviolable save only to the officers of justice. The Mayor of Toulouse has informed the people under his administration that, for the purpose of forming a sanitary house inventory, officers of the Bureau of Hygiene would attend on all the premises to draw up a survey. He added that all who refused admittance would render themselves liable to summary conviction. Many property owners saw in this demand an attack on the inviolability of the private domicile, and addressed a resolution on the subject to the Council of State. The Council decided that the right of ordering the inspection of property in a commune to determine whether its hygienic arrangements are satisfactory already belongs to the mayor by virtue of the very liberal powers vested in him by the law of Feb. 15th, 1902 (Protection of Public Health) The exercise of such powers would be, however, in many cases rendered nugatory without examination of premises. The establishment of a sanitary inventory does not, in the Council's view, impose any special restraint on private property.

The Recrudescence of Rabies in Paris.

I have already called attention to the increase of rabies among dogs in Paris. This increase has now become alarming, and M. Martel, chief veterinary surgeon to the Prefecture of the Seine, has pointed out to the Academy the grave danger which threatens. In the Paris area 411 cases of rabies were reported in 1918, and 61 during the first 25 days of the month of January just past; compare this with the 3 or 4 cases per annum with which we had to reckon in 1913 and 1914. 350 bitten people have attended the Pasteur Institute, and several deaths have occurred, three of which are recent. Stray dogs without leash or muzzle are numerous in Paris. The disease is thought to have been carried by dogs abandoned by their masters in the war zone, and by others which have escaped from the camps established near Paris to test the effect of the new asphyxiating gases. M. Martel demands the application of strict police measures: all dogs should be numbered, registered, and obliged to wear a collar with a medal attached certifying that the tax has been paid by their owners; in addition, they should all be muzzled. Stray dogs should be ruthlessly collected by police agents and brought to the special depôt (*La Fourière*) to be destroyed if not claimed within a week.

Feb. 10th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Medical Reform for Ireland.

THE dilatoriness of the Government in putting forward any scheme of health reform for Ireland parallel with the Ministry of Health Bill for Great Britain is causing energetic protest on the part of the various medical corporations and organisations in Ireland. The need for reform is admitted on all sides, lay and medical, and, indeed is far more urgent in Ireland than in England, inasmuch as Ireland has had little or no part in the sanitary progress of the last 50 years. Ireland still stands where England was a generation ago. It is held here, not only in medical circles, that the mere application of the English Ministry of Health Bill to Ireland, or even the establishment of a special Ministry of Health for Ireland, would be of little avail. Conditions are so backward that thoroughgoing medical reform must go hand-in-hand with the establishment of a Ministry of Health. The reform must include the unification of the Poor-law Medical Services and the medical services given under the National Health Insurance Acts, the establishment of medical inspection of schools, the provision of medical and dental treatment of school children, the reform of the entire hospital system, the development of a thorough sanitary system, and the endowment of medical research. Such a scheme of reform should constitute an important part of the work of national reconstruction. In this connexion it is interesting to note that both the Irish Reconstruction Association, under the presidency of Sir Horace Plunkett, and the new Centre Party, have appointed special committees to report on the problem of health reform, while the latter organisation has adopted health and housing reform as one of "the planks of its platform." Medical opinion in the country is also taking steps to make itself felt. The Royal College of Physicians of Ireland has had the matter under consideration, and at its last meeting decided to invite the other medical corporations and the various voluntary medical organisations in the country to unite in a joint deputation to the Chief Secretary, if he should be willing to receive it, in order to persuade him of the urgency of the problem of health reform in its bearing on the welfare and happiness of Ireland.

Sir William Whitla, M.P.

Sir William Whitla has resigned his position as senior physician to the Royal Victoria Hospital, Belfast, and, having been thanked for his services, has been placed on the consulting staff. He is also about to give up the chair of materia medica at the Belfast University, a professorship held by him since the year 1890.

The Royal Victoria Hospital, Belfast.

At the usual bi-monthly meeting of the Board of Management of the Royal Victoria Hospital, Belfast, held on Feb. 5th, a communication was received to the effect that Mr. Evelyn Cecil, Secretary-General of the Chapter of St. John of Jerusalem, would present to the hospital the

pathological equipment of the splendid laboratory attached to the well-known St. John's Hospital at Etaples, a base institution which was bombed by the Germans, and which was afterwards transferred to Trouville. Fortunately, at the time of the German vandalism the fittings of the pathological laboratory escaped. In addition to the laboratory equipment, a quantity of dressings are also included in the gift, which is made in recognition of the services of Major Thomas Houston, O.B.E. (in charge of the laboratory), Dr. John MacIlwaine, Dr. W. McCloy, Dr. Foster Coates, and Dr. W. Wilson, all old members of the Belfast Medical School, who were attached to the hospital at Etaples during the war. This magnificent gift was gladly accepted, and the board of management passed a resolution of special thanks. The pathological outfit (such articles are very hard to get at present) will be of the greatest advantage to the medical school, and the Government are arranging to send a special ship from France to Belfast with all the articles on board.

Feb. 10th.

URBAN VITAL STATISTICS.

(Week ended Feb. 1st, 1919.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had declined from 16·1 to 15·0 per 1,000 in the four preceding weeks, rose to 17·2 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the annual death-rate was 16·9, or 2·8 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 6·0 in Barrow-in-Furness, 7·8 in Wimbledon, and 9·0 in Willesden, to 29·8 in Sunderland, 30·3 in West Hartlepool, and 31·4 in Wigan. The principal epidemic diseases caused 158 deaths, which corresponded to an annual rate of 0·5 per 1,000, and included 53 from infantile diarrhœa, 48 from diphtheria, 27 from whooping-cough, 15 from measles, 9 from scarlet fever, and 6 from enteric fever. Whooping-cough caused a death-rate of 1·0 in Rhondda and 1·1 in Sunderland and diphtheria of 1·4 in Bolton. The deaths from influenza, which had declined from 755 to 222 in the 12 preceding weeks, rose to 272, and included 88 in London, 28 in Liverpool, 11 in Newcastle-on-Tyne, 10 in Sunderland and 9 in Manchester and in Leeds. There were 7 cases of small-pox, 1054 of scarlet fever, and 1178 of diphtheria under treatment in the Metropolitan Asylums Board Hospitals and the London Fever Hospital, against 6, 1057, and 1174 respectively at the end of the previous week. The causes of 57 deaths in the 96 towns were uncertified, of which 43 were registered in Liverpool, 8 in Birmingham, 5 in Manchester, and 4 in Sunderland.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was 18·4, against 17·0 and 18·1 per 1000 in the two preceding weeks. The 362 deaths in Glasgow corresponded to an annual rate of 16·9 per 1000, and included 12 from whooping-cough, 4 from diphtheria, 2 each from measles and infantile diarrhœa, and 1 from scarlet fever. The 138 deaths in Edinburgh were equal to an annual rate of 21·4 per 1000, and included 7 from whooping-cough.

Irish Towns.—The 183 deaths in Dublin corresponded to an annual rate of 23·6, or 0·6 per 1000 above that recorded in the previous week, and included 3 from infantile diarrhœa, 2 from scarlet fever, and 1 each from measles and whooping-cough. The 113 deaths in Belfast were equal to a rate of 14·7 per 1000, and included a fatal case of diphtheria.

(Week ended Feb. 8th, 1919.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had been 15·0 and 17·2 per 1000 in the two preceding weeks, further rose to 21·0 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the annual death-rate was 20·2, or 3·3 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 9·1 in Enfield, 9·3 in Grimsby, and 10·2 in Aberdare, to 33·0 in Huddersfield, 33·5 in Newcastle-on-Tyne, 33·7 in Liverpool, and 53·3 in Wigan. The principal epidemic diseases caused 176 deaths, which corresponded to an annual rate of 0·6 per 1000, and included 57 from diphtheria, 47 from infantile diarrhœa, 34 from whooping-cough, 22 from measles, 9 from scarlet fever, and 7 from enteric fever. The deaths from influenza, which had been 274, 222, and 272 in the three preceding weeks, further rose to 604, and included 100 in London, 55 in Liverpool, 42 in Newcastle-on-Tyne, 37 in Bradford, 28 in Manchester, 27 in Wigan, and 25 in Huddersfield. There were 5 cases of small-pox, 1080 of scarlet fever, and 1156 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 7, 1059, and 1178 respectively at the end of the previous week. The causes of 64 deaths in the 96 towns were uncertified, of which 9 were registered in Liverpool, 8 in Birmingham, 7 in Darlington, and 5 in Preston.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality, which had increased from 17·0 to 18·4 per 1000 in the three preceding weeks, further rose to 23·8 per 1000. The deaths from influenza numbered 31, while in 163 deaths classified as due to other conditions influenza was a contributory cause; in the previous week these numbers were 13 and 89 respectively. The 449 deaths in Glasgow corresponded to an annual rate of 20·9 per 1000, and included 15 from whooping cough, 4 from measles, 3 from diphtheria, and 1 from infantile diarrhœa. The 274 deaths in Edinburgh were equal to a rate of 42·5 per 1000, and included 13 from whooping-cough and 1 from diphtheria.

Irish Towns.—The 194 deaths in Dublin corresponded to an annual rate of 25·0, or 1·4 per 1000 above that recorded in the previous week, and included 3 from infantile diarrhœa. The 168 deaths in Belfast were equal to a rate of 21·8 per 1000, and included a fatal case of enteric fever and of diphtheria.

The War and After.

THE CASUALTY LIST.

THE names of the following medical officers appear among the casualties announced since our last issue:—

Died.

Capt. E. A. W. Henley, New Zealand M.C., qualified at Dublin in 1901, and was a well-known practitioner at Napier, N.Z., where he died.

Capt. A. G. S. Logie, R.A.M.C. (T.F.), qualified at Edinburgh in 1887, and prior to joining up was in practice at Newport, Mon., where he was public vaccinator to the Raglan District. He died at the 1st Northern General Hospital of pneumonia.

Temp. Surg. W. P. Cowper, R.N., qualified at Glasgow in 1903, and held appointments at the West End Hospital for Nervous Diseases, at the Hampstead General Hospital, and at the Royal Westminster Ophthalmic Hospital. He was in practice in London prior to joining the Navy, and died from an illness contracted during the Battle of Jutland.

Capt. R. Aitken, R.A.M.C.

Surg.-Com. J. A. Keogh, R.N., qualified in Ireland in 1886, and joined the Royal Navy shortly afterwards.

Capt. J. S. Cocks, R.A.M.C., was a student at Guy's Hospital, London, and qualified in 1912.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported:—

Capt. C. C. Bamber, Royal Warwickshire Regiment, died at Kohat, India, eldest son of Col. C. J. Bamber, I.M.S. (retired),

Capt. J. H. Milligan, Indian Army, reported missing September, 1915, now reported died of wounds at that time, eldest son of the late Dr. D. Milligan, of Edinburgh.

Lieut. J. R. Milligan, Indian Army Reserve of Officers, reported wounded and missing March, 1916, now presumed killed at that time, son of the late Dr. D. Milligan, of Edinburgh.

Lieut. B. R. Garrod, North Lancs Regiment, attached R.A.F., died in France of pneumonia, youngest and last surviving son of Col. Sir A. Garrod, K.C.M.G., A.M.S., of Chandos street, London, W.

Lieut. S. C. Johnson, late R.F.A., died suddenly after illness contracted on active service, son of the late Col. W. E. Johnson, I.M.S.

THE HONOURS LIST.

The following awards to medical officers in recognition of their gallantry and devotion to duty in the field are announced. All are members of the R.A.M.C. except where otherwise stated:—

Bar to Distinguished Service Order.

Major (Temp. Lieut.-Col.) DAVID AHERN, D.S.O.—For conspicuous gallantry and devotion to duty from August 30th to Sept. 3rd, 1918, during operation on the Arras front. He was responsible for the clearing of casualties from the divisional front. He showed great forethought in selecting sites for his forward posts, especially in establishing one post in a village which proved of the utmost value as an A.D.S. later on. He was wounded while at his work, but refused to leave until the conclusion of operations. His energy and resource were instrumental in the prompt evacuation of the wounded.

Capt. (acting Lieut.-Col.) ALEXANDER DONALD FRASER, D.S.O., M.C.—For conspicuous gallantry and devotion to duty. He was in charge of bearer divisions during the operations in the neighbourhood of Moyenneville—Ervillers—St. Leger from August 21st to August 28th, 1918, and was continually among the leading troops under heavy shell and machine-gun fire directing the evacuation of wounded from R.A.P.'s. He managed to get ambulance cars close up to the firing line, which greatly accelerated the clearing of casualties to the rear. He was untiring throughout the whole period, and set a fine example to those under him.

Major (acting Lieut.-Col.) CHARLES READE MUNROE MORRIS, D.S.O.—For exceptional gallantry and devotion to duty on Sept. 20th to 24th south-west of Villers Guislain, in working continually for five days under heavy shell fire, supervising and coordinating the work of the medical officers while at work at night in the advanced dressing station. It was twice blown in by shell burst. He carried out important surgical work, and by his pluck and endurance set a fine example to all around him.

Distinguished Service Order.

Lieut.-Col. WILLIAM HAROLD KERR ANDERSON, Can. A.M.C.—During the operations before Arras, Sept. 2nd–5th, he was in charge of the evacuation of wounded. He succeeded in keeping in close touch with the infantry during the whole of the battle, so that the wounded were evacuated almost as soon as they became casualties. His duties were often performed under enemy artillery fire which caused many casualties, but by his courage and personal example he kept his men at their splendid work until all casualties were carried out.

Major (acting Lieut.-Col.) WILLIAM ALFRED GORDON BAULD, Can. A.M.C.—For conspicuous gallantry and devotion to duty during mounted operations from Oct. 8th to 11th, 1918. He was in command of the advanced cavalry field ambulances. On the night of Oct. 9th-10th, when ordered to search and clear the wounded from three villages, which were being heavily shelled and the approaches badly damaged by craters, he organised the evacuation of the wounded, making certain that all were found and removed. He showed great coolness and energy.

Major DONALD DUNBAR COUTTS, Aust. A.M.C.—On Sept. 1st, 1918, during the attack at Mont St. Quentin, although the R.A.P. was consistently shelled, he attended the wounded almost continuously for 52 hours, during five of which he was forced to wear his gas respirator, displaying throughout the greatest courage and devotion to duty. On the day prior to the attack a shell burst on a dug-out, wounding several men and pressing one down, severely wounded, blocking the entrance. He immediately went forward, regardless of intense shell fire, and succeeded in extricating the man and removing him, over exposed ground, to the rear.

Major GEORGE WILLIAM HALL, Can. A.M.C.—For conspicuous gallantry and devotion to duty. During the action in front of Arras, from Sept. 2nd-6th he was in charge of the evacuation of wounded. Time and time again he went through heavy enemy shell and machine-gun fire to direct the clearing of the wounded. On the afternoon of Sept. 2nd he succeeded in clearing a number of wounded who were being shelled with gas shell to a place of safety, and dressed many wounded under heavy fire. His work throughout the battle was admirable.

Temp. Capt. (acting Major) HUGH ROSS MACINTYRE, M.C.—For conspicuous gallantry and devotion to duty during operations on the Piave between Oct. 27th and 29th, 1918, especially on the morning of the 27th when in charge of stretcher-bearers. He crossed to the right bank of the Piave immediately behind the infantry under very heavy fire, and supervised the collection and evacuation of the wounded under great difficulties, having to ford the river several times. He set a very fine example to all under him by his untiring energy and total disregard for his own safety.

Lieut.-Col. JAMES HARDIE NEIL, N.Z.A.M.C.—For conspicuous gallantry and devotion to duty during operations near Bapaume and Bancourt from August 23rd to Sept. 3rd, 1918. He was in command of the ambulance and constantly visited the forward R.A.P. under heavy shell fire, and selected positions for the bearer relay posts. During the action round Bancourt he went forward with two light ambulance cars to within a few hundred yards of the front line and supervised the evacuation. It was owing to his gallantry and personal supervision that the evacuation of the wounded was so successfully carried out.

Capt. PATRICK JOSEPH FRANCIS O'SHEA, M.C., Aust. A.M.C.—For conspicuous gallantry and devotion to duty near Chuignes on August 23rd, 1918. Keeping up with the advance, he was always in the hottest part of the line dressing wounded and organising stretcher-bearers. Realising that an R.A.P. could not cope with the casualties, he dressed them where they lay and made prisoners carry them back. In many cases he carried men back himself under heavy fire of all descriptions and working in gas-drenched areas. He had no rest for three days and nights, and did another medical officer's work as well as his own.

Temp. Capt. (acting Major) PHILIP RANDAL WOODHOUSE, M.C.—For conspicuous gallantry and devotion to duty in command of a bearer division. On Sept. 27th, 1918, at Maison Rouge, when loading wounded on an ambulance wagon it was damaged and an ammunition dump close by set on fire by heavy shelling. He at once got the fire out and evacuated the wounded to safety. On two other occasions he did good work under heavy shell fire, clearing a road which was blocked by a tree blown across it and also in evacuating wounded when his A.D.S. was hit by a shell.

Third Bar to Military Cross.

Temp. Capt. CHARLES GORDON TIMMS, M.C.—For conspicuous gallantry and devotion to duty near Cambrai on Oct. 1st, 1918. During a severe enemy barrage, when his C.O. was wounded, he at once took up a squad of stretcher-bearers into the barrage to the rescue, tending his wounds and seeing that he was conveyed to a place of safety.

Second Bar to Military Cross.

Temp. Capt. (acting Major) GEORGE BOYD McTAVISH, M.C.—For conspicuous gallantry and devotion to duty west of Villers Guislain from Sept. 19th to 27th, 1918. He worked for eight days and nights, refusing to be relieved, walking constantly through heavy barrages and machine-gun fire, organising bearer squads on the whole divisional front. Although gassed he still carried on, and saved the life of an officer who was knocked over by a shell when he was talking to him, holding an artery until help came, he himself having been knocked over by the same shell.

Bar to Military Cross.

Capt. JOHN ERNEST AFFLECK, M.D., Can. A.M.C.—For conspicuous gallantry and devotion to duty during the fighting east of Arras, Aug. 26th-28th, 1918. His work was carried out under continuous shell and machine-gun fire, and many times he led his bearers close up to the front line, collecting seriously wounded men. By his cool judgment and energy he was enabled to get all the wounded under cover.

Temp. Capt. (acting Major) JOHN CRAWFORD, M.C.—In the area north of Ypres occupied by Belgian troops on Sept. 28th-30th, 1918 he was conspicuous for his indefatigable efforts in evacuating the wounded from six field batteries and ten T.M. batteries. During the advance he was constantly well ahead, with complete disregard for his own safety, under heavy shell-fire, and by his initiative and organisation all the wounded were evacuated smoothly and rapidly.

Capt. WILLIAM DONALD, M.C.—For conspicuous gallantry and devotion to duty during operations against Sugar Loaf and Thetassel on Sept. 18th and 19th, 1918. He went fearlessly forward under the heaviest fire to rescue wounded lying in front of the enemy's positions. By his courage he set the finest example to his stretcher bearers, and was instrumental in saving many lives. He worked unceasingly for three days, and refused to rest until all wounded had been brought in.

Capt. CHARLES MARSH GOZNEY, M.C.—For conspicuous gallantry and devotion to duty during the attacks on Happy Valley and Moislains between August 24th and Sept. 2nd, 1918. He showed great initiative in moving his aid-posts forward and keeping in touch with the advanced troops. His arrangements for the evacuation of the wounded were splendid, and he undoubtedly was responsible for the saving of many lives.

Temp. Capt. FRANCIS HENDERSON, M.C.—For conspicuous gallantry and devotion to duty at Masnieres on Oct. 1st, 1918. He worked under heavy fire throughout the day and cleared the battlefield all through the night. Hearing that two officers of another division were lying out severely wounded, he made his way to them under heavy shell fire, dressed them, and brought them safely in. His work throughout was magnificent.

Capt. KENNETH ARTHUR McLEAN, M.C., Aust. A.M.C.—On August 31st, 1918, near Clery, the battery was heavily shelled, two men being killed and two badly injured. He immediately went to the battery and commenced dressing one man who could not be moved. He continued his work until one shell burst close to him, wounding him severely in the arm and mortally wounding the stretcher-bearer who was assisting him. He showed marked courage and devotion to duty.

Temp. Capt. HENRY LESLIE MESSENGER, M.C.—For conspicuous gallantry and devotion to duty on Sept. 18th, 1918, near Dol-tej-li. He led a party of stretcher-bearers some 400 yards across the open through a heavy barrage, and succeeded in re-cuing and bringing in a large number of casualties to his advanced post. The next day he established touch forward with the attacking battalions under heavy artillery and machine-gun fire. Throughout the action he showed the greatest energy and disregard of personal danger.

Capt. DUNCAN ARNOLD MORRISON, M.C., Can. A.M.C.—For conspicuous gallantry and devotion to duty during the operations on Sept. 2nd and 3rd, 1918, between Cagnicourt and Buissy, when he kept in touch with four infantry battalions, repeatedly going up and down under heavy fire, hastening the evacuation of the wounded. He was untiring in searching for any who might have been overlooked and directing the bearers in their duties. His coolness and judgment helped on the evacuation enormously.

Capt. (acting Major) WILLIAM BARRY POSTLETHWAITE, M.C.—For conspicuous gallantry and devotion to duty on August 22nd, 1918, in clearing casualties at the crossing of the Ancre river. On August 25th, 1918, he had great difficulties in the advance beyond Fricourt, owing to heavy shelling, but by a daring reconnaissance found a comparatively safe track for evacuating the wounded. On August 30th, north of Combles, after searching all night, he again found a practicable evacuation route. His endurance and initiative were beyond praise.

Capt. (acting Major) JOHN GRAY RONALDSON, M.C.—For conspicuous gallantry and devotion to duty in the operations near Cambrai from Sept. 18th to 30th 1918. He was in charge of the bearer s clearing the divisional front, and during the whole period he was living under heavy shell fire, including gas. Through casualties to M.O.s, he had only one officer left to help him, but by constantly visiting the front posts he cleared all casualties and his cheerfulness kept up the spirits of the bearers.

Temp. Capt. (acting Major) WILLIAM RUSSELL, M.C.—For conspicuous gallantry and devotion to duty whilst in command of bearers near Bailleul on August 22nd and 24th and Sept. 3rd, 1918. He constantly visited all the R.A.P. by day and night, often under considerable shell and machine-gun fire and disposed his bearers and ambulance cars with such skill that all wounded were collected and placed in the most favourable conditions for recovery with the utmost celerity. Later he was gassed by a direct hit on his A.D.S., but continued to evacuate wounded until his relief arrived.

Capt. CEDRIC MURRAY SAMSON, M.C., Aust. A.M.C.—On the morning of August 22nd, 1918, north of Chipilly, on the Bray-Corbie Road, he took a car along to the R.A.P. in spite of heavy shelling and gas. He superintended the line of evacuation continually, taking fresh squads up to R.A.P. through heavy fire. Again, on August 31st, he dressed a wounded medical officer and his orderly in the open, being wounded while doing so. During the period August 20th-31st, 1918, his fearless energy and devotion to duty were responsible for the rapid evacuation of so many wounded.

Capt. HUGH KINGSLEY WARD, M.C.—For conspicuous gallantry and devotion to duty on July 10th, 1918, when, after an intense bombardment of several hours, the enemy attacked the battalion sector east of Neuport Bains. During the bombardment he went up to the front line and remained in attendance on a badly wounded officer until he died. He was subsequently wounded while attending another officer, but continued looking after many other wounded men until he returned to the dressing station, when he worked for over two hours in the open, and when the enemy approached he stood outside to prevent them bombing the wounded.

The Military Cross.

Capt. HUGH WANSEY BAYLY.—On Sept. 16th, 1918, at Saudemont, when the village was heavily bombarded, in spite of the fact that he himself was ill, he remained at his post dressing and attending to the wounded, and throughout a trying period he displayed admirable composure and disregard of danger.

Temp. Capt. (acting Major) JAMES BIGGAM.—For conspicuous gallantry and devotion to duty. On the night of Oct. 3rd-4th, 1918, he carried important messages to advanced collecting posts at Joncourt, the road being under heavy machine gun fire and bombing from aircraft. On the night of Oct. 9th-10th he carried out an exhaustive reconnaissance of roads and villages under heavy shell fire. His untiring energy was worthy of great praise.

Lieut. GEORGE EDMONDSON BIRKETT.—For conspicuous gallantry and devotion to duty throughout Sept. 15th and 16th, 1918, during operations south of Maissemy. Working under heavy shell and machine-gun fire he brought in several wounded men. The enemy shot down many stretcher-bearers and stretcher parties on the 16th, but this officer worked indefatigably and continued to search for and bring in wounded until he was wounded in the spine by a sniper on the 16th. By his personal courage and energy he undoubtedly saved many valuable lives.

Temp. Capt. DANIEL MICHAEL BOHAN.—For conspicuous gallantry and devotion to duty during the attack on the "P" Ridge on Sept. 18th 1918. Having established an aid post and dressed a very large number of casualties, he moved forward with stretcher-bearers in front of the line and brought in wounded from the most exposed positions under trench-mortar and machine-gun fire. He worked continuously from dawn to dark, regardless of personal danger.

Capt. (now Major) JOHN ALFRED BRIGGS, Can. A.M.C.—During the fighting east of Arras, August 26–28th, 1918, this officer worked continuously. On many occasions he led his stretcher-bearers forward close up to the front line under heavy shell and machine-gun fire to dress and evacuate wounded. Although blown up and bruised by a shell he refused to leave, and remained on duty. He set a fine example of gallantry and devotion to duty.

Capt. (acting Major) HECTOR MACKAY CALDER, D.S.O.—For conspicuous courage during operations between August 22nd and Sept. 8th, 1918, in the region of Happy Valley, north of Bray, and at Moislains. He did most valuable work evacuating wounded under most strenuous conditions, and during the many periods of heavy shelling his untiring zeal was a powerful stimulus to all ranks.

Capt. FREDERICK THOMAS CAMPBELL, Can. A.M.C.—For conspicuous gallantry and devotion to duty. During an advance on the Canal du Nord on Sept. 3rd, 1918, the battalion suffered heavy casualties from shell fire and as it was impracticable to evacuate the wounded he went up and attended to them under heavy fire. Throughout four days he was conspicuous for his disregard of fatigue or danger, and undoubtedly saved many lives by his efforts.

Temp. Capt. GRAHAM WILSON CHRISTIE.—For conspicuous gallantry and devotion to duty during operations on Oct. 1st and 2nd, 1918, near Gheluwe. He dressed the casualties of the advanced guard, under heavy shelling and machine-gun fire. During 36 hours he evacuated over 200 wounded from different units, working continuously without rest. His skill and quickness undoubtedly saved lives.

Capt. LEWIS PIERS CHURCHILL, Can. A.M.C.—During the fighting east of Arras, August 26th–28th, 1918, he was continuously on duty under heavy shell fire, and had absolutely no relief during the whole period. He kept in touch with all his R.A.P. and was responsible for the rapid evacuation of his wounded from the forward line. His zeal and devotion to duty were admirable.

Temp. Capt. AILWYN HERBERT CLARKE.—For conspicuous gallantry and devotion to duty on Oct. 10th, 1918, about two miles north-west of Le Cateau. He several times proceeded under heavy shelling to the sunken road south-east of Rambourlieux Farm, to attend to wounded. He succeeded in dressing all the wounded under heavy fire, and got them carried away to safety.

Capt. HERBERT AUGUSTUS COCHRANE, Can. A.M.C.—On Sept. 2nd, 1918, when the battalion attacked the Drocourt-Queant line, although wounded two days previously, he remained at duty and established a dressing station well forward before zero hour. Shortly after the start of the attack he dressed several cases under heavy barrage and continued forward, dressing many wounded in the open under machine-gun fire. He worked all day, continually exposing himself, and his gallant conduct undoubtedly saved a great deal of suffering.

Capt. FREDERICK BRECKEN DAY, Can. A.M.C.—On Sept. 2nd, 1918, near Arras, for marked gallantry and devotion to duty. During the course of the battle he made many trips under heavy machine gun fire to dress wounded, and afterwards dressed wounded for hours in his aid-post, not only those of his own battalion but also of at least five other battalions and many wounded of the enemy. It was without doubt due to his exertions that the wounded were cleared so quickly, and many lives were saved thereby.

Temp. Lieut. CHRISTOPHER DEAN.—For conspicuous gallantry and devotion to duty at Holnon during the operations of Sept. 17th and 19th 1918. Although suffering from a sprained ankle, he was untiring in his efforts to collect and attend wounded. He was constantly exposed to shell fire, but took no notice for himself, though he made his stretcher-bearers take cover.

Temp. Capt. FREDERICK ROBERT DOUGAN.—On August 26th, 1918, near Mametz, when this officer was clearing an infantry brigade, the Sussex Regiment was held up in a valley, the only exit from which was in full view of the enemy. Throughout the day this officer repeatedly brought up squads of bearers and superintended the removal of the wounded under continued heavy fire. Had it not been for his personal courage the wounded of the battalion could not have been cleared for many hours. On another occasion he personally led a single squad under heavy fire in order to bring in a wounded N.C.O. of his own bearer division.

Temp. Capt. JOHN MELVILLE ELLIOT.—For conspicuous gallantry and devotion to duty under heavy fire when in charge of stretcher-bearers on Sept. 18th–19th, 1918. He took squads backwards and forwards from A.D.S. to R.A.P. near Sugar Loaf through heavy barrages. He also assisted in dressing wounded for 48 hours unceasingly in a constantly shelled camp. It was mainly due to his initiative and disregard of personal danger that touch was kept with R.M.O.'s under very trying circumstances.

Temp. Capt. ALEXANDER KEITH FORBES.—For conspicuous gallantry and devotion to duty east of the Canal du Nord on Sept. 27th, 1918. Soon after zero he established the R.A.P. in the Canal, having to cross a stretch of ground swept by machine-gun fire. From this well-chosen forward post he was able to dress all the wounded of his own and other units, undoubtedly saving many lives. He went out many times into the shell swept area and brought in wounded.

Capt. NORMAN McLEOD HALKETT, Can. A.M.C.—For conspicuous gallantry and devotion to duty during operations against the Drocourt-Queant line near Dury between Sept. 1st–3rd, 1918. Near Vis-en-Artois the area in which the regimental aid-post was located was persistently searched by enemy artillery, causing many casualties. He attended to the wounded in the open in spite of heavy shelling. Later the regimental aid post was established in an open trench, and he again carried on under severe shell fire with untiring energy and utter disregard for his own personal safety.

Capt. JOHN CLAUDE MOSELEY HARPER, Aust. A.M.C.—During the operations on the Somme River and east of Mont St. Quentin on August 29th and Sept. 2nd, 1918, he displayed the greatest gallantry and coolness in attending the wounded, although he was under heavy shell and machine gun fire for the whole time. His untiring energy and splendid example and his personal supervision of the evacuation of the wounded yielded excellent results in spite of most trying conditions.

Temp. Lieut. BENJAMIN HUTCHESON.—During the operations east of Arras on August 30th, 1918, he displayed conspicuous gallantry and devotion to duty, working in the open under heavy machine-gun and artillery fire attending to the wounded with an unselfish disregard of danger that was a splendid example to all.

Capt. FREDERIC HOWART JAMES, Aust. A.M.C.—During the attack on Peronne on Sept. 1st–3rd, 1918, this officer was conspicuous for his gallantry and devotion to duty, working unceasingly under heavy fire and practically without sleep during the whole period, attending to a large number of wounded. His energy and untiring self-sacrifice were worthy of the highest praise.

Temp. Capt. HENRY MICHAEL JOSEPH.—During operations from August 8th–10th, 1918, near Marlancourt, this medical officer displayed great courage and energy in dealing with the wounded. On August 10th, 1918, he moved forward immediately behind the fighting troops and saved many lives by timely action. When the objective was gained, and battle patrols went out, the enemy's machine-gun fire was especially heavy, he nevertheless went forward and dealt with cases, carrying one badly wounded man to a place of safety on his back under heavy fire.

(To be concluded.)

The following awards for services rendered in East Africa are announced:—

C.M.G.—Temp. Lt.-Col. H. B. G. Newham, R.A.M.C.; Maj. (acting Lt.-Col.) R. E. Humfrey, R.A.M.C.

C.I.E.—Lt.-Col. (temp. Col.) W. W. Clemesha, I.M.S.

O.B.E.—Capt. C. P. B. Wall, S. Afr. M.C.; Capt. I. J. Block, S. Afr. M.C.; Temp. Capt. A. G. Eldred, Nyasaland M.S.; Temp. Capt. C. R. Howard, R.A.M.C.; Temp. Capt. Q. Madge, R.A.M.C.; Temp. Capt. L. R. H. P. Marshall, R.A.M.C.; Temp. Capt. S. Mason, S. Afr. M.C.; Capt. G. McG. Millar, I.M.S.; Temp. Maj. R. Semple, R.A.M.C.; Temp. Maj. R. Standish White, R.A.M.C.

To be Brevet Major.—Capt. (acting Lt.-Col.) J. D. Kidd, M.C., R.A.M.C.; Capt. (acting Lt.-Col.) J. A. Manifold, D.S.O., R.A.M.C.; Capt. E. A. Sutton, M.C., R.A.M.C.

Military Cross.—Capt. A. Robertson, R.A.M.C.

MENTIONED IN DESPATCHES.

The names of the following medical officers are mentioned in despatches:—

British Salonika Force.

Staff.—Maj. (temp. Lt.-Col.) J. A. Anderson, R.A.M.C.; Col. E. T. F. Birrell, C.B., C.M.G., A.M.S.; Col. H. J. M. Buist, C.M.G., D.S.O., A.M.S.; Capt. (acting Maj.) W. F. Christie, R.A.M.C.; Lt.-Col. (acting Col.) T. E. Fielding, D.S.O., R.A.M.C.; Maj. W. R. Galwey, O.B.E., M.C., R.A.M.C.; Lt.-Col. J. E. Hodgson, O.B.E., R.A.M.C. (died); Maj. and Bt. Lt.-Col. (temp. Col.) C. W. Holden, D.S.O., R.A.M.C.; Maj.-Gen. M. P. C. Holt, K.C.M.G., C.B., D.S.O., A.M.S.; Capt. (acting Maj.) N. V. Lothian, M.C., R.A.M.C.; Lt.-Col. C. B. Martin, C.M.G., R.A.M.C.; Lt.-Col. and Bt. Col. (temp. Col.) W. H. S. Nickerson, V.C., C.M.G., R.A.M.C.

Army Medical Service.—Temp. Col. L. S. Dudgeon, C.M.G.; Temp. Col. R. E. Kelly, C.B. (Capt. and Bt. Maj., R.A.M.C. (T.F.)); Temp. Col. A. G. Phear, C.B.

Royal Army Medical Corps.—Temp. Capt. (acting Maj.) A. G. Anderson; Temp. Capt. D. I. Anderson, O.B.E.; Temp. Capt. J. C. M. Bailey, O.B.E.; Temp. Capt. (acting Maj.) G. V. Bakewell, O.B.E.; Temp. Capt. V. J. Bonavia; Lt.-Col. M. Boyle, O.B.E.; Temp. Capt. M. S. Bryce, M.C.; Qrmr. and Lt. (temp. Maj.) W. H. Butler; Temp. Capt. (acting Maj.) S. Campbell; Temp. Capt. L. Cassidy; Temp. Capt. A. H. Coleman, O.B.E.; Temp. Capt. J. A. Delmege, O.B.E.; Temp. Capt. R. R. Kilworthy, O.B.E.; Temp. Capt. C. Y. Flewitt; Temp. Capt. G. O. Hempson; Temp. Capt. (acting Maj.) J. V. Holmes; Temp. Capt. N. E. Kendall; Temp. Capt. F. Newey; Temp. Capt. J. L. H. Paterson; Temp. Capt. (acting Maj.) W. H. Peacock; Temp. Capt. W. Thomas; Lt.-Col. A. D. Waring; Temp. Capt. J. Warnock; Temp. Capt. J. S. Webster; Temp. Lt.-Col. C. M. Wenyon, C.M.G.; Temp. Capt. H. O. West; Temp. Capt. E. C. White.

R.A.M.C. (S.R.).—Capt. (acting Maj.) T. Y. Barkley, O.B.E.; Capt. R. D. Cameron; Capt. (acting Maj.) W. B. Foley, O.B.E.; Capt. A. G. Harsant; Capt. G. M. Hetherington; Capt. H. E. McColl, O.B.E.; Capt. (acting Maj.) R. McKinlay; Capt. W. O. F. Sinclair.

R.A.M.C. (T.F.).—Capt. G. L. Findlay; Maj. (temp. Lt.-Col.) J. Gray, O.B.E.; Capt. T. S. Hele; Capt. A. M. Jones; Maj. (acting Lt.-Col.) A. E. Kidd; Capt. (acting Maj.) J. C. Marklove; Lt.-Col. P. Mitchell, O.B.E.; Capt. (acting Lt.-Col.) R. P. Nash; Capt. (temp. Lt.-Col.) J. Patrick; Capt. (acting Maj.) H. A. Playfair-Robertson; Capt. J. Steedman; Capt. (acting Maj.) W. D. Sturrock, D.S.O.; Capt. (acting Maj.) J. Taylor, O.B.E.; Lt.-Col. F. E. A. Webb, O.B.E.

East African Force.

Staff.—Col. G. W. Tate, C.M.G., D.S.O., A.M.S.

R.A.M.C.—Capt. D. C. Buchanan; Temp. Capt. C. E. Clay; Temp. Capt. H. M. Fisher; Temp. Capt. T. J. H. Hoskin; Temp. Capt. C. R. Howard (died); Maj. (acting Lt.-Col.) R. E. Humfrey; Temp. Capt. Q. Madge; Temp. Capt. L. R. H. P. Marshall; Temp. Lt.-Col. H. B. G. Newham; Temp. Maj. R. Semple; Temp. Capt. E. W. L. Sharp; Temp. Maj. R. Standish-White.

South African Medical Corps.—Capt. C. P. Bligh-Wall; Capt. I. J. Block; Temp. Capt. S. Colyer; Lt. T. J. Dwyer; Temp. Capt. T. A. Fuller; Capt. A. W. Goldsmith; Temp. Capt. S. Mason; Temp. Capt. W. McG. Montgomery; Maj. R. C. Morley-Hoare; Capt. (acting Maj.) W. H. R. Sutton.

East African Medical Service.—Capt. W. A. Trumper; Maj. (acting Lt.-Col.) A. D. J. R. Williams.

Nyasaland Medical Service.—Temp. Capt. H. E. Arbuckle; Temp. Capt. A. G. Eldred.

Rhodesian Medical Corps.—Temp. Capt. F. Innes; Temp. Capt. R. R. Murray; Temp. Capt. W. J. Sheehan.

Indian Medical Service.—Capt. W. D. Keyworth; Capt. G. McG. Millar; Capt. W. J. Simpson; Lt.-Col. R. F. Standage.

Major (acting Lieut.-Col.) WILLIAM ALFRED GORDON BAULD, Can. A.M.C.—For conspicuous gallantry and devotion to duty during mounted operations from Oct. 8th to 11th, 1918. He was in command of the advanced cavalry field ambulances. On the night of Oct. 9th-10th, when ordered to search and clear the wounded from three villages, which were being heavily shelled and the approaches badly damaged by craters, he organised the evacuation of the wounded, making certain that all were found and removed. He showed great coolness and energy.

Major DONALD DUNBAR COUTTS, Aust. A.M.C.—On Sept. 1st, 1918, during the attack at Mont St. Quentin, although the R.A.P. was consistently shelled, he attended the wounded almost continuously for 52 hours, during five of which he was forced to wear his gas respirator, displaying throughout the greatest courage and devotion to duty. On the day prior to the attack a shell burst on a dug-out, wounding several men and pressing one down, severely wounded, blocking the entrance. He immediately went forward, regardless of intense shell fire, and succeeded in extricating the man and removing him, over exposed ground, to the rear.

Major GEORGE WILLIAM HALL, Can. A.M.C.—For conspicuous gallantry and devotion to duty. During the action in front of Arras, from Sept. 2nd–6th he was in charge of the evacuation of wounded. Time and time again he went through heavy enemy shell and machine-gun fire to direct the clearing of the wounded. On the afternoon of Sept. 2nd he succeeded in clearing a number of wounded who were being shelled with gas shell to a place of safety, and dressed many wounded under heavy fire. His work throughout the battle was admirable.

Temp. Capt. (acting Major) HUGH ROSS MACINTYRE, M.C.—For conspicuous gallantry and devotion to duty during operations on the Piave between Oct. 27th and 29th, 1918, especially on the morning of the 27th when in charge of stretcher-bearers. He crossed to the right bank of the Piave immediately behind the infantry under very heavy fire, and supervised the collection and evacuation of the wounded under great difficulties, having to ford the river several times. He set a very fine example to all under him by his untiring energy and total disregard for his own safety.

Lieut.-Col. JAMES HARDIE NEIL, N.Z.A.M.C.—For conspicuous gallantry and devotion to duty during operations near Bapaume and Bancourt from August 23rd to Sept. 3rd, 1918. He was in command of the ambulance and constantly visited the forward R.A.P. under heavy shell fire, and selected positions for the bearer relay posts. During the action round Bancourt he went forward with two light ambulance cars to within a few hundred yards of the front line and supervised the evacuation. It was owing to his gallantry and personal supervision that the evacuation of the wounded was so successfully carried out.

Capt. PATRICK JOSEPH FRANCIS O'SHEA, M.C., Aust. A.M.C.—For conspicuous gallantry and devotion to duty near Chuignes on August 23rd, 1918. Keeping up with the advance, he was always in the hottest part of the line dressing wounded and organising stretcher-bearers. Realising that an R.A.P. could not cope with the casualties, he dressed them where they lay and made prisoners carry them back. In many cases he carried men back himself under heavy fire of all descriptions and working in gas-drenched areas. He had no rest for three days and nights, and did another medical officer's work as well as his own.

Temp. Capt. (acting Major) PHILIP RANDAL WOODHOUSE, M.C.—For conspicuous gallantry and devotion to duty in command of a bearer division. On Sept. 27th, 1918, at Maison Rouge, when loading wounded on an ambulance wagon it was damaged and an ammunition dump close by set on fire by heavy shelling. He at once got the fire out and evacuated the wounded to safety. On two other occasions he did good work under heavy shell fire, clearing a road which was blocked by a tree blown across it and also in evacuating wounded when his A.D.S. was hit by a shell.

Third Bar to Military Cross.

Temp. Capt. CHARLES GORDON TIMMS, M.C.—For conspicuous gallantry and devotion to duty near Cambrai on Oct. 1st, 1918. During a severe enemy barrage, when his C.O. was wounded, he at once took up a squad of stretcher-bearers into the barrage to the rescue, tending his wounds and seeing that he was conveyed to a place of safety.

Second Bar to Military Cross.

Temp. Capt. (acting Major) GEORGE BOYD McTAVISH, M.C.—For conspicuous gallantry and devotion to duty west of Villers Guislain from Sept. 19th to 27th, 1918. He worked for eight days and nights, refusing to be relieved, walking constantly through heavy barrages and machine-gun fire, organising bearer squads on the whole divisional front. Although gassed he still carried on, and saved the life of an officer who was knocked over by a shell when he was talking to him, holding an artery until help came, he himself having been knocked over by the same shell.

Bar to Military Cross.

Capt. JOHN ERNEST AFFLECK, M.C., Can. A.M.C.—For conspicuous gallantry and devotion to duty during the fighting east of Arras, Aug. 26th–28th, 1918. His work was carried out under continuous shell and machine-gun fire, and many times he led his bearers close up to the front line, collecting seriously wounded men. By his cool judgment and energy he was enabled to get all the wounded under cover.

Temp. Capt. (acting Major) JOHN CRAWFORD, M.C.—In the area north of Ypres occupied by Belgian troops on Sept. 28th–30th, 1918 he was conspicuous for his indefatigable efforts in evacuating the wounded from six field batteries and ten T.M. batteries. During the advance he was constantly well ahead, with complete disregard for his own safety, under heavy shell-fire, and by his initiative and organisation all the wounded were evacuated smoothly and rapidly.

Capt. WILLIAM DONALD, M.C.—For conspicuous gallantry and devotion to duty during operations against Sugar Loaf and Thetassel on Sept. 18th and 19th, 1918. He went fearlessly forward under the heaviest fire to rescue wounded lying in front of the enemy's positions. By his courage he set the finest example to his stretcher bearers, and was instrumental in saving many lives. He worked unceasingly for three days, and refused to rest until all wounded had been brought in.

Capt. CHARLES MARSH GOZNEY, M.C.—For conspicuous gallantry and devotion to duty during the attacks on Happy Valley and Moislains between August 24th and Sept. 2nd, 1918. He showed great initiative in moving his aid-posts forward and keeping in touch with the advanced troops. His arrangements for the evacuation of the wounded were splendid, and he undoubtedly was responsible for the saving of many lives.

Temp. Capt. FRANCIS HENDERSON, M.C.—For conspicuous gallantry and devotion to duty at Masnieres on Oct. 1st, 1918. He worked under heavy fire throughout the day and cleared the battlefield all through the night. Hearing that two officers of another division were lying out severely wounded, he made his way to them under heavy shell fire, dressed them, and brought them safely in. His work throughout was magnificent.

Capt. KENNETH ARTHUR McLEAN, M.C., Aust. A.M.C.—On August 31st, 1918, near Clery, the battery was heavily shelled, two men being killed and two badly injured. He immediately went to the battery and commenced dressing one man who could not be moved. He continued his work until one shell burst close to him, wounding him severely in the arm and mortally wounding the stretcher-bearer who was assisting him. He showed marked courage and devotion to duty.

Temp. Capt. HENRY LESLIE MESSENGER, M.C.—For conspicuous gallantry and devotion to duty on Sept. 18th, 1918, near Dolejeli. He led a party of stretcher-bearers some 400 yards across the open through a heavy barrage, and succeeded in rescuing and bringing in a large number of casualties to his advanced post. The next day he established touch forward with the attacking battalions under heavy artillery and machine-gun fire. Throughout the action he showed the greatest energy and disregard of personal danger.

Capt. DUNCAN ARNOLD MORRISON, M.C., Can. A.M.C.—For conspicuous gallantry and devotion to duty during the operations on Sept. 2nd and 3rd, 1918, between Cagnicourt and Buissy, when he kept in touch with four infantry battalions, repeatedly going up and down under heavy fire, hastening the evacuation of the wounded. He was untiring in searching for any who might have been overlooked and directing the bearers in their duties. His coolness and judgment helped on the evacuation enormously.

Capt. (acting Major) WILLIAM BARRY POSTLETHWAITE, M.C.—For conspicuous gallantry and devotion to duty on August 22nd, 1918, in clearing casualties at the crossing of the Ancre river. On August 25th, 1918, he had great difficulties in the advance beyond Fricourt, owing to heavy shelling, but by a daring reconnaissance found a comparatively safe track for evacuating the wounded. On August 30th, north of Combles, after searching all night, he again found a practicable evacuation route. His endurance and initiative were beyond praise.

Capt. (acting Major) JOHN GRAY RONALDSON, M.C.—For conspicuous gallantry and devotion to duty in the operations near Cambrai from Sept. 18th to 30th 1918. He was in charge of the bearer clearing the division al front, and during the whole period he was living under heavy shell fire, including gas. Through casualties to M.O.s, he had only one officer left to help him, but by constantly visiting the front posts he cleared all casualties and his cheerfulness kept up the spirits of the bearers.

Temp. Capt. (acting Major) WILLIAM RUSSELL, M.C.—For conspicuous gallantry and devotion to duty whilst in command of bearers near Bailleul on August 22nd and 24th and Sept. 3rd, 1918. He constantly visited all the R.A.P. by day and night, often under considerable shell and machine-gun fire and disposed his bearers and ambulance cars with such skill that all wounded were collected and placed in the most favourable conditions for recovery with the utmost celerity. Later he was gassed by a direct hit on his A.D.S., but continued to evacuate wounded until his relief arrived.

Capt. CEDRIC MURRAY SAMSON, M.C., Aust. A.M.C.—On the morning of August 22nd, 1918, north of Chipilly, on the Bray-Corbie Road, he took a car along to the R.A.P. in spite of heavy shelling and gas. He superintended the line of evacuation continually, taking fresh squads up to R.A.P. through heavy fire. Again, on August 31st, he dressed a wounded medical officer and his orderly in the open, being wounded while doing so. During the period August 20th–31st, 1918, his fearless energy and devotion to duty were responsible for the rapid evacuation of so many wounded.

Capt. HUGH KINGSLEY WARD, M.C.—For conspicuous gallantry and devotion to duty on July 10th, 1918, when, after an intense bombardment of several hours, the enemy attacked the battalion sector east of Neuport Bains. During the bombardment he went up to the front line and remained in attendance on a badly wounded officer until he died. He was subsequently wounded while attending another officer, but continued looking after many other wounded men until he returned to the dressing station, when he worked for over two hours in the open, and when the enemy approached he stood outside to prevent them bombing the wounded.

The Military Cross.

Capt. HUGH WANSEY BAYLY.—On Sept. 16th, 1918, at Saudemont, when the village was heavily bombarded, in spite of the fact that he himself was ill, he remained at his post dressing and attending to the wounded, and throughout a trying period he displayed admirable composure and disregard of danger.

Temp. Capt. (acting Major) JAMES BIGGAM.—For conspicuous gallantry and devotion to duty. On the night of Oct. 3rd–4th, 1918, he carried important messages to advanced collecting posts at Joncourt, the road being under heavy machine gun fire and bombing from aircraft. On the night of Oct. 9th–10th he carried out an exhaustive reconnaissance of roads and villages under heavy shell fire. His untiring energy was worthy of great praise.

Lieut. GEORGE EDMONDSON BICKETT.—For conspicuous gallantry and devotion to duty throughout Sept. 15th and 16th, 1918, during operations south of Malsemy. Working under heavy shell and machine-gun fire he brought in several wounded men. The enemy shot down many stretcher-bearers and stretcher parties on the 16th, but this officer worked indefatigably and continued to search for and bring in wounded until he was wounded in the spine by a sniper on the 16th. By his personal courage and energy he undoubtedly saved many valuable lives.

Temp. Capt. DANIEL MICHAEL BUCHAN.—For conspicuous gallantry and devotion to duty during the attack on the "P" Ridge on Sept. 18th 1918. Having established an aid post and dressed a very large number of casualties, he moved forward with stretcher-bearers in front of the line and brought in wounded from the most exposed positions under trench-mortar and machine-gun fire. He worked continuously from dawn to dark, regardless of personal danger.

Capt. (now Major) JOHN ALFRED BRIGGS, Can. A.M.C.—During the fighting east of Arras, August 26–28th, 1918, this officer worked continuously. On many occasions he led his stretcher-bearers forward close up to the front line under heavy shell and machine-gun fire to dress and evacuate wounded. Although blown up and bruised by a shell he refused to leave, and remained on duty. He set a fine example of gallantry and devotion to duty.

Capt. (acting Major) HECTOR MACKAY CALDER, D.S.O.—For conspicuous courage during operations between August 22nd and Sept. 8th, 1918, in the region of Happy Valley, north of Bray, and at Moislains. He did most valuable work evacuating wounded under most strenuous conditions, and during the many periods of heavy shelling his untiring zeal was a powerful stimulus to all ranks.

Capt. FREDERICK THOMAS CAMPBELL, Can. A.M.C.—For conspicuous gallantry and devotion to duty. During an advance on the Canal du Nord on Sept. 3rd, 1918, the battalion suffered heavy casualties from shell fire and as it was impracticable to evacuate the wounded he went up and attended to them under heavy fire. Throughout four days he was conspicuous for his disregard of fatigue or danger, and undoubtedly saved many lives by his efforts.

Temp. Capt. GRAHAM WILSON CHRISTIE.—For conspicuous gallantry and devotion to duty during operations on Oct. 1st and 2nd, 1918, near Gheluwe. He dressed the casualties of the advanced guard, under heavy shelling and machine-gun fire. During 36 hours he evacuated over 200 wounded from different units, working continuously without rest. His skill and quickness undoubtedly saved lives.

Capt. LEWIS PIERS CHURCHILL, Can. A.M.C.—During the fighting east of Arras, August 26th–28th, 1918, he was continuously on duty under heavy shell fire, and had absolutely no relief during the whole period. He kept in touch with all his R.A.P. and was responsible for the rapid evacuation of his wounded from the forward line. His zeal and devotion to duty were admirable.

Temp. Capt. AILWYN HERBERT CLARKE.—For conspicuous gallantry and devotion to duty on Oct. 10th, 1918, about two miles north-west of Le Cateau. He several times proceeded under heavy shelling to the sunken road south-east of Rambourlieux Farm, to attend to wounded. He succeeded in dressing all the wounded under heavy fire, and got them carried away to safety.

Capt. HERBERT AUGUSTUS COCHRANE, Can. A.M.C.—On Sept. 2nd, 1918, when the battalion attacked the Drocourt-Queant line, although wounded two days previously, he remained at duty and established a dressing station well forward before zero hour. Shortly after the start of the attack he dressed several cases under heavy barrage and continued forward, dressing many wounded in the open under machine-gun fire. He worked all day, continually exposing himself, and his gallant conduct undoubtedly saved a great deal of suffering.

Capt. FREDERICK BRECKEN DAY, Can. A.M.C.—On Sept. 2nd, 1918, near Arras, for marked gallantry and devotion to duty. During the course of the battle he made many trips under heavy machine gun fire to dress wounded, and afterwards dressed wounded for hours in his aid-post, not only those of his own battalion but also of at least five other battalions and many wounded of the enemy. It was without doubt due to his exertions that the wounded were cleared so quickly, and many lives were saved thereby.

Temp. Lieut. CHRISTOPHER DEAN.—For conspicuous gallantry and devotion to duty at Holnon during the operations of Sept. 17th and 19th 1918. Although suffering from a sprained ankle, he was untiring in his efforts to collect and attend wounded. He was constantly exposed to shell fire, but took no notice for himself, though he made his stretcher-bearers take cover.

Temp. Capt. FREDERICK ROBERT DOUGAN.—On August 26th, 1918, near Mametz, when this officer was clearing an infantry brigade, the Sussex Regiment was held up in a valley, the only exit from which was in full view of the enemy. Throughout the day this officer repeatedly brought up squads of bearers and superintended the removal of the wounded under continued heavy fire. Had it not been for his personal courage the wounded of the battalion could not have been cleared for many hours. On another occasion he personally led a single squad under heavy fire in order to bring in a wounded N.C.O. of his own bearer division.

Temp. Capt. JOHN MELVILLE ELLIOT.—For conspicuous gallantry and devotion to duty under heavy fire when in charge of stretcher-bearers on Sept. 18th–19th, 1918. He took squads backwards and forwards from A.D.S. to R.A.P. near Sugar Loaf through heavy barrages. He also assisted in dressing wounded for 48 hours unceasingly in a constantly shelled camp. It was mainly due to his initiative and disregard of personal danger that touch was kept with R.M.O.'s under very trying circumstances.

Temp. Capt. ALEXANDER KEITH FORBES.—For conspicuous gallantry and devotion to duty east of the Canal du Nord on Sept. 27th, 1918. Soon after zero he established the R.A.P. in the Canal, having to cross a stretch of ground swept by machine-gun fire. From this well-chosen forward post he was able to dress all the wounded of his own and other units, undoubtedly saving many lives. He went out many times into the shell swept area and brought in wounded.

Capt. NORMAN McLEOD HALKETT, Can. A.M.C.—For conspicuous gallantry and devotion to duty during operations against the Drocourt-Queant line near Dury between Sept. 1st–3rd, 1918. Near Vis-en-Artois the area in which the regimental aid-post was located was persistently searched by enemy artillery, causing many casualties. He attended to the wounded in the open in spite of heavy shelling. Later the regimental aid post was established in an open trench, and he again carried on under severe shell fire with untiring energy and utter disregard for his own personal safety.

Capt. JOHN CLAUDE MOSELEY HARPER, Aust. A.M.C.—During the operations on the Somme River and east of Mont St. Quentin on August 29th and Sept. 2nd, 1918, he displayed the greatest gallantry and coolness in attending the wounded, although he was under heavy shell and machine gun fire for the whole time. His untiring energy and splendid example and his personal supervision of the evacuation of the wounded yielded excellent results in spite of most trying conditions.

Temp. Lieut. BENJAMIN HUTCHESON.—During the operations east of Arras on August 30th, 1918, he displayed conspicuous gallantry and devotion to duty, working in the open under heavy machine-gun and artillery fire attending to the wounded with an unselfish disregard of danger that was a splendid example to all.

Capt. FREDERIC HOWARD JAMES, Aust. A.M.C.—During the attack on Peronne on Sept. 1st–3rd, 1918, this officer was conspicuous for his gallantry and devotion to duty, working unceasingly under heavy fire and practically without sleep during the whole period, attending to a large number of wounded. His energy and untiring self-sacrifice were worthy of the highest praise.

Temp. Capt. HENRY MICHAEL JOSEPH.—During operations from August 8th–10th, 1918, near Marlancourt, this medical officer displayed great courage and energy in dealing with the wounded. On August 10th, 1918, he moved forward immediately behind the fighting troops and saved many lives by timely action. When the objective was gained, and battle patrols went out, the enemy's machine-gun fire was especially heavy; he nevertheless went forward and dealt with cases, carrying one badly wounded man to a place of safety on his back under heavy fire.

(To be concluded.)

The following awards for services rendered in East Africa are announced:—

C.M.G.—Temp. Lt.-Col. H. B. G. Newham, R.A.M.C.; Maj. (acting Lt.-Col.) R. E. Humfrey, R.A.M.C.

C.I.E.—Lt.-Col. (temp. Col.) W. W. Clemesha, I.M.S.

O.B.E.—Capt. C. P. B. Wall, S. Afr. M.C.; Capt. I. J. Block, S. Afr. M.C.; Temp. Capt. A. G. Eldred, Nyasaland M.S.; Temp. Capt. C. R. Howard, R.A.M.C.; Temp. Capt. Q. Madge, R.A.M.C.; Temp. Capt. L. R. H. P. Marshall, R.A.M.C.; Temp. Capt. S. Mason, S. Afr. M.C.; Capt. G. McG. Millar, I.M.S.; Temp. Maj. R. Semple, R.A.M.C.; Temp. Maj. R. Standish White, R.A.M.C.

To be Brevet Major.—Capt. (acting Lt.-Col.) J. D. Kidd, M.C., R.A.M.C.; Capt. (acting Lt.-Col.) J. A. Manifold, D.S.O., R.A.M.C.; Capt. E. A. Sutton, M.C., R.A.M.C.

Military Cross.—Capt. A. Robertson, R.A.M.C.

MENTIONED IN DESPATCHES.

The names of the following medical officers are mentioned in despatches:—

British Salonika Force.

Staff.—Maj. (temp. Lt.-Col.) J. A. Anderson, R.A.M.C.; Col. B. T. F. Birrell, C.B., C.M.G., A.M.S.; Col. H. J. M. Buist, C.M.G., D.S.O., A.M.S.; Capt. (acting Maj.) W. F. Christie, R.A.M.C.; Lt.-Col. (acting Col.) T. S. Fielding, D.S.O., R.A.M.C.; Maj. W. R. Galwey, O.B.E., M.C., R.A.M.C.; Lt.-Col. J. E. Hodgson, O.B.E., R.A.M.C. (died); Maj. and Bt. Lt.-Col. (temp. Col.) C. W. Holden, D.S.O., R.A.M.C.; Maj.-Gen. M. P. C. Holt, K.C.M.G., C.B., D.S.O., A.M.S.; Capt. (acting Maj.) N. V. Lothian, M.C., R.A.M.C.; Lt.-Col. C. B. Martin, C.M.G., R.A.M.C.; Lt.-Col. and Bt. Col. (temp. Col.) W. H. S. Nickerson, V.C., C.M.G., R.A.M.C.

Army Medical Service.—Temp. Col. L. S. Dudgeon, C.M.G.; Temp. Col. R. R. Kelly, C.B. (Capt. and Bt. Maj., R.A.M.C. (T.F.)); Temp. Col. A. G. Phear, C.B.

Royal Army Medical Corps.—Temp. Capt. (acting Maj.) A. G. Anderson; Temp. Capt. D. I. Anderson, O.B.E.; Temp. Capt. J. C. M. Bailey, O.B.E.; Temp. Capt. (acting Maj.) G. V. Bakewell, O.B.E.; Temp. Capt. V. J. Bonavia; Lt.-Col. M. Boyle, O.B.E.; Temp. Capt. M. S. Bryce, M.C.; Qrmr. and Lt. (temp. Maj.) W. H. Butler; Temp. Capt. (acting Maj.) S. Campbell; Temp. Capt. L. Cassidy; Temp. Capt. A. H. Coleman, O.B.E.; Temp. Capt. J. A. Delmege, O.B.E.; Temp. Capt. R. R. Elworthy, O.B.E.; Temp. Capt. C. Y. Flewitt; Temp. Capt. G. O. Hempson; Temp. Capt. (acting Maj.) J. V. Holmes; Temp. Capt. N. E. Kendall; Temp. Capt. F. Newey; Temp. Capt. J. L. H. Paterson; Temp. Capt. (acting Maj.) W. H. Peacock; Temp. Capt. W. Thomas; Lt.-Col. A. D. Waring; Temp. Capt. J. Warnock; Temp. Capt. J. S. Webster; Temp. Lt.-Col. C. M. Wenyon, C.M.G.; Temp. Capt. H. O. West; Temp. Capt. E. C. White.

R.A.M.C. (S.R.).—Capt. (acting Maj.) T. Y. Barkley, O.B.E.; Capt. R. D. Cameron; Capt. (acting Maj.) W. B. Foley, O.B.E.; Capt. A. G. Harsant; Capt. G. M. Hetherington; Capt. H. E. McColl, O.B.E.; Capt. (acting Maj.) R. McKinlay; Capt. W. O. F. Sinclair.

R.A.M.C. (T.F.).—Capt. G. L. Findlay; Maj. (temp. Lt.-Col.) J. Gray, O.B.E.; Capt. T. S. Hele; Capt. A. M. Jones; Maj. (acting Lt.-Col.) A. E. Kidd; Capt. (acting Maj.) J. C. Marklove; Lt.-Col. P. Mitchell, O.B.E.; Capt. (acting Lt.-Col.) R. P. Nash; Capt. (temp. Lt.-Col.) J. Patrick; Capt. (acting Maj.) H. A. Playfair-Robertson; Capt. J. Steedman; Capt. (acting Maj.) W. D. Sturrock, D.S.O.; Capt. (acting Maj.) J. Taylor, O.B.E.; Lt.-Col. F. E. A. Webb, O.B.E.

East African Force.

Staff.—Col. G. W. Tate, C.M.G., D.S.O., A.M.S.

R.A.M.C.—Capt. D. C. Buchanan; Temp. Capt. C. E. Clay; Temp. Capt. H. M. Fisher; Temp. Capt. T. J. H. Hoskin; Temp. Capt. C. R. Howard (died); Maj. (acting Lt.-Col.) R. E. Humfrey; Temp. Capt. Q. Madge; Temp. Capt. L. R. H. P. Marshall; Temp. Lt.-Col. H. B. G. Newham; Temp. Maj. R. Semple; Temp. Capt. E. W. L. Sharp; Temp. Maj. R. Standish-White.

South African Medical Corps.—Capt. C. P. Bligh-Wall; Capt. I. J. Block; Temp. Capt. S. Colyer; Lt. T. J. Dwyer; Temp. Capt. T. A. Fuller; Capt. A. W. Goldsmith; Temp. Capt. S. Mason; Temp. Capt. W. McG. Montgomery; Maj. R. C. Morley-Hoare; Capt. (acting Maj.) W. H. R. Sutton.

East African Medical Service.—Capt. W. A. Trumper; Maj. (acting Lt.-Col.) A. D. J. B. Williams.

Nyasaland Medical Service.—Temp. Capt. H. E. Arbuckle; Temp. Capt. A. G. Eldred.

Rhodesian Medical Corps.—Temp. Capt. F. Innes; Temp. Capt. R. R. Murray; Temp. Capt. W. J. Sheehan.

Indian Medical Service.—Capt. W. D. Keyworth; Capt. G. McG. Millar; Capt. W. J. Simpson; Lt.-Col. R. F. Standage.

THE SERVICES.

PAY IN THE INDIAN MEDICAL SERVICE.

THE Secretary of State for India received on Feb. 10th a deputation from the British Medical Association regarding the pay and prospects of the Indian Medical Service, when he explained the steps which had been taken and which it was hoped to take in future to improve the conditions of the Indian Medical Service as regards pay, leave (including study leave), and facilities for research. Regarding the pay of the Service, he announced that he had sanctioned the introduction, with effect from Dec. 1st, 1918, of improvements in the rates of pay for permanent officers of the Indian Medical Service on both the military and the civil sides approximating in the aggregate to an increase of 33⅓ per cent. on the present rates of military grade pay. These rates are as follows:—

Rank.	Grade pay. Rs.
Lieutenant	350
Captain	400
,, after 5 years' service	450
,, after 7 years' service	500
,, after 10 years' service	550
Major	650
,, after 3 years' service as Major ... ... ,,	750
Lieutenant-Colonel	900
,, ,, specially selected for increased pay	1000

The detailed rates of pay to give effect to this decision are being worked out in India and will be announced as soon as possible.

The object of this measure being to attract to the Service European candidates with the highest professional qualifications, the question whether Indian candidates entering the permanent Service after Dec 1st, 1918, shall be eligible for increased rates of pay, and if so, to what extent and under what conditions, has been reserved for future consideration. All Indian officers already in the permanent Service on Dec. 1st, 1918, will be eligible for the increased rates of pay. As regards private practice Mr. Montagu explained that, subject to the reservation that it must be under the control of Government, he was of opinion that it was to the public interest that the Service should enjoy as fully as possible opportunities of private practice, and he assured the deputation that no further restriction of the facilities for private practice now enjoyed by the Service was contemplated.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. J. Menary is placed on the Retired List with rank of Surgeon-Captain.

To be temporary Surgeon-Lieutenants: P. Banbury, A. C. Halliwell, E. P. Brockman, A. T. Hawley, E. K. Macdonald, W. M. Anthony, P. Lloyd-Williams, C. T. Belsham, C. F. McLean, A. E. Ward, E. C. W. Cooke.

Temp. Surg. Lieuts. A. W. Cocking, J. G. Stevens, and H. C. C. Veitch have been transferred to the Permanent List as Surgeon-Lieutenants.

ARMY MEDICAL SERVICE.

Lieutenant-Colonels, from R.A.M.C., to be Colonels: Temp. Col. N. Faichnie, C. B. Martin, Temp. Col. A. G. Thompson, C.M.G., D.S.O, J. B. Anderson, A. H. Waring, D.S.O., Temp. Col S. A. Archer, J. McD McCarthy.

Temp. Col. C. C. Choyce relinquishes his commission.

Temp Col. H. A. Ballance (Major (temp. Lieut.-Col.), R.A.M.C., T.F.), relinquishes his temporary commission on re-posting.

The undermentioned temporary appointment as Staff Surgeon is made at the War Office: Capt. T. Sheehy, R.A.M.C., Spec. Res.

ROYAL ARMY MEDICAL CORPS.

Majors to be Lieutenant-Colonels: Acting Lieut.-Cols. R F. Ellery, H. A. Bransbury, J. F. Whelan, C D. Myles, H. R. Bateman, S. B. Smith, M. W. Falkner; Temp. Lieut.-Cols. A. J. Hull, H. A. Davidson; and J. H. Brunskill, W. M. B. Sparkes, R. McK. Skinner, R. L. Popham.

Capt. (acting Major) R. G. Gauntlett, R.A.M.C. (T.F.), to be temporary Lieutenant-Colonel whilst specially employed.

Temp. Major G. W. Milne to be acting Lieutenant-Colonel whilst commanding troops on a hospital ship.

To be acting Lieutenant-Colonels whilst in command of a Medical Unit: Majors W. C. Nimmo, R. F. M. Fawcett; Capts. O W. McSheehy, E. Cattord; Acting Major J. J D. Rocke; Temp. Capt. T. H Martin.

Temp Capt. (acting Major) W. J. A. B. Wishart relinquishes his commission and retains the rank of Major.

Relinquishing the acting rank of Major on re-posting: Capts. F. R. Laing, S. M. Hattersley; Temp. Capts. R. B. Macfie, E. C. Chipp, G. C. Price, J. L. Menzies.

Major A G. Cummins is restored to the establishment.

To be acting Majors whilst specially employed: Capt. A. E. B. Jones, Temp. Capts. E. Lawse, E. B. Barton, S. A Owen, H. V. A. Gatchell.

To be acting Majors: Capts. B. A. Odium, E. A Strachan, R. W. Vint, H. P. Hart, W. Foot, D. H. C. MacArthur; Temp. Capts. T. H Oliver, A. C. S. Courts, D. C. McCabe-Dallas, J. L. Wilson, C. R. Gibson, G. P. Armstrong, J. F. McG. Sloan, J. W. Robertson, J. Parkinson, A. U. Millar, L. Crabb, J. M. Burnford, D. Fraser, J. N Humphreys, J. L Jackson, G. Jackson, T. Stordy, W. H. Hardy; Lieut. (temp. Capt.) F R. S. Shaw.

Major W. Tibbits is retained on the Active List and to be supernumerary.

Capt. (acting Major) W. B. Allen, V.C., from R.A.M.C. (T.F.), to be Captain and to retain his acting rank.

Lieutenants (temporary Captains) to be Captains: W. J. Robertson, W. O'Brien (acting Major), F. R. S. Shaw, C. Russell (acting Major), R. Stowers, W. J. Knight, R. A. Mansell (acting Major).

Capt. Claude M. Rigby is restored to the establishment.

Lieutenants to be temporary Captains: J. Brown, J. J. Dowdall, G. W. Reynaldson.

Temporary Lieutenants to be Temporary Captains: A. B. Rosher, H. S. Lister, G. Stanger, A. N. Fell, H. L. Taylor, F. Robinson, A. Ashkenny, A. H Firth, A. G. L. Smith.

Temp. Hon. Lieut. E. B Fitzgerald to be temporary Honorary Captain whilst serving with No. 22 General Hospital (Harvard Unit).

Officers relinquishing their commissions: Temp. Lieut.-Col. A. J. J. Johnston, and retains the rank of Lieutenant-Colonel; Temp. Lieut.-Col. A. W. Falconer on re-posting.

Major E. F Q. L'Estrange and Capt. O. C. P. Cooke relinquish the acting rank of Lieutenant-Colonel on re-posting.

Temp Hon. Lieut.-Col. H. Cabot, Temp. Hon. Majors G. C. Shattuck, E. G. Crabtree, B. H. Alton, V. H Kazajian, Temp. Hon. Capts. E. Harding F. Brigham, P. Gustafson, D. E. Ford, E S Welles, E. S. Fish, F. Packard, C. N. Lewis, W. S. Ramsey, L. M. Van Stone, R. M. Dodson, D. J. Knowlton, F. L. Johnson, A. Gregg, E. B. Fitzgerald, H. W. Woodward. Temp Hon. Lieut. M. M. Stevens relinquish their commissions on ceasing to serve with No. 22 General Hospital (Harvard Unit) and retain their honorary rank.

Temporary Majors retaining the rank of Major: E. K. Martin, J. F. Cunningham, A. Neve.

Captains (to retain rank of Captain): M. A. O'Callagan, R. S. Smith.

Temp. Capts. (acting Majors) (retaining the rank of Major): J. W. Billett, F. G. Collins, J. R. Craig, H. D. Smart, S. J. Rowntree, A. C. T. Woodward, E. Burstal. Temp. Capts. W. A. Young (and retain the rank of Captain), R. Davidson, W. C. C. Kirkwood, A. I. Shepheard-Walwyn, J Sullivan, H. Snape, H. A. Lyth, D. Glen, H. C. Taylor, G. E. A. Mitchell, C. W. Windsor, W. S. Campbell, H. Y. Mansfield, H. J. Beddow, A. N. Cox, W G. Attenborough, C. S. Iles, G. J. Meldon, A. L. Walker, W. Mason (acting Major), W. J. Crow, D. M. Callender, G. W. Stanley, D. Kennedy, D. MacKinnon, R. J. W. McKane, B. P. Campbell, H. M L. Crawford, R. Evans, I. Flack, J M. Ahern, D. R. Acheson, W. A. Dewhirst, E. A. Price, F. A. Juler, W. S. Garden, A. H. Laird, D. M. Bohan, H. E. Heapy, C. C. Austen, A. V. Boyall, W. E. James, J. E. Mitchell, L. C. Newton, W. A. Thompson, P. A Sullivan, F. D. Simpson, P. S. H. Patey, J. M. Lazenby, J. D. Marshall, H. R. Cran, A. W. Ewing, L L. Winterbotham, A. E. Leapingwell, L. B. C. Trotter, J. P. Carroll, N. Kennedy, J. F. Weston, E.G. Bark J. Kitchen, H.G. Rashleigh, A. H. Morley, G. Garland, P. Steele (acting Lieut.-Col.) (retains rank of Lieutenant-Colonel), C. D. Goodenough, G. M. Davies, A. Morton, C. B Hutchison, A. H. Burnett, A Emerson, H. D. Ledward C D. Rankin, G. R. Doreshian, E. H. B. Oram, J. D. Barris, E. L. N. Rhodes, J. Gaff, S. C. W. Morris, D. W. Roy (acting Major), C. L. Warke, J J. Smith, H. Maffin, W. Craig, R O. Lee, C Duncan, J. M. Anderson, O.C. Adam J. D. Mercer, T R Evans, V. S Partridge, A S L. Malcolm, C. McK. Craig, J. Young, W. Fairclough, P. Allan, D. Ross, W. J. Ashley, J. A. Jones (acting Major), E. J. Fisher, P. MacFadyen, J. R. Hewetson, R. S. Woods, J. Bain, C. H Harbinson, J. Sullivan, N. Bradley, V. E. Babcock, J. L. Rankine (acting Major), J. McKie, A. J. M Wright (acting Major), A. L. Saunders (acting Major), T. B. Williams, F. J. Morris, F. N. Stewart, L J. Hood, O. Bruce.

Temporary Captains to retain the rank of Captain: H. R. L. Allot, G. Leggat, J. W. Bride, C. Banks, F. W. MacKichan, G. S. Deane, E. R. D Macnochie S. T. Davies, J. R. B. Dobson, M. D. MacKenzie, J. K. Muir, A. C. Brown, C. A. Birts, H. Sinson, P. Figdor, A. B. Vine, A. E. Buckett, M. A. Swan, J. Pirie, J. M. Shaw, W. E. A. Worley, R. S. Stevenson, A. Bradshaw, I. J. Roche, A. Snelley, J. W. Trevan, H. V. White, R Hughes, M. T. Morgan, F G. Sergeant, A. E. Hart, H. B yth, C. G. A. Chislett, E. E. Hughes, H. S. Knight, H. Christal, J. G. Moseley (acting Major), D. G. McRae, J. Robertson, A. B eley, J H. E. Davis, R. Steel, W. J. Stephens, L. W Shadwell, W. O. McKane, T. Marron, G. Wight, P. S. Clarke, D. C. MacLachlan, F. W. W. Smith, W. C. Jardine, A. G. W. Owen, J. McN. Murray, R. S. Ellis, S. H Robinson, T. B. Watson, H. Millar, H. E. Humphrys, J. B. Binns, F R. L. Atkins.

Temp. Capts. P. T. Spencer-Phillips, A. Duncan, to relinquish their commissions; Temp. Hon Capts. S. A Henry and A. D. Brunwin (on ceasing to be employed with St. John's Amb. Brig. Hosp., and retain the honorary rank of Captain).

Temp. Lieuts. (to retain the rank of Lieutenant): J. W. Steohen, J. K. Boon, A. Ashkenny, C. S. Macaskie, F J. Gordon, M. M. Munden, W. Knapp, A S. L. Biggart, R. F. Parker, C. L. Lapper, A. F. Calwell, Z. M. H. Ross, W. E. Jones, E. A. King, E. D. D. Davis.

Canadian Army Medical Corps.

Temporary Captains to be Temporary Majors: S. L. Walker, F. W. Manning.

Temporary Captain D. A Clark to be acting Major while employed at No. 9 Canadian Stationary Hospital.

Temp. Capt. T. W Sutherland to be acting Major while employed at No. 8 Canadian Stationary Hospital.

Temporary Captain A Collins to be acting Major while employed at Canadian Convalescent Hospital, Bear Wood.

Canadian Army Dental Corps.

Temp. Lieut. A. Kennedy, from 2nd Central Ontario Regiment, to be temporary Lieutenant.

ROYAL AIR FORCE.

Medical Branch.—Captains to be graded for pay as Captains: A. A. Atkinson, W. H. H. Bennett, R E. Bell, H S. Baker, R D. Goldie, J. J. C. Hamilton, F. C. Kempson, J. M Kirkness, A. MacLennan, J. A. Parsons, F. Roberts, C. P C. Sargent, A. Scott-Turner, C. J. G. Taylor, C. Webb, N. R. Williamson.

A. E. P. Parker (temporary Surgeon, R.N.) is granted a temporary commission as Captain.

Capt. H. C. Bazett (R.A.M.C., Spec. Res.) is transferred to unemployed list.

C. F. Eminson is granted a temporary commission as Lieutenant.

Major (acting Lieut.-Col.) A. H. Cheatle relinquishes his commission on ceasing to be employed, and is permitted to retain the rank of Lieutenant-Colonel.

Correspondence.

"Audi alteram partem."

THE MEDICAL EFFECTS OF THE TUBE STRIKE.

To the Editor of THE LANCET.

SIR,—The medical profession has a special interest in the effect of the recent Tube strike upon the poorer classes of London and its suburbs. The absence of travelling facilities inflicted more than mere hardship upon thousands of delicate and elderly individuals of both sexes, workers all of them. Only the medical man can know the thousands of injuries received in the struggle to enter the overcrowded buses, and the serious and fatal illnesses incurred by the long walks through frost and sleet after the day's labour, and the insidious beginnings of chronic ill-health originated by the suffering uncomplainingly borne by those who were obliged to spend sleepless nights on the floors of offices and crowded lodging-houses.

It has been suggested that medical men and women should compile with care a list of these results which are known to them personally. Revolution, with its bloody toll of human lives belonging to the upper classes, may leave the imagination of the worker cold. The illness and death of fellow workers, brought about by his hasty action, would of a surety bring home to him the cruelty he had unwittingly caused, and lead him to realise that the action of the Government in taking precautions to become independent of Labour had as motive not the protection of the capitalist but the protection of the workers themselves.

I am, Sir, yours faithfully,

Weymouth-street, W., Feb. 11th, 1919. AGNES SAVILL.

A NATIONAL MEDICAL SERVICE: WHAT IS IT WORTH?

To the Editor of THE LANCET.

SIR,—In the programme of reconstruction figures largely the Ministry of Health, which is generally expected to deal with the question of supplying medical assistance to the whole or a portion of society. This is a question which must interest the public as well as the medical profession, and this letter may help everyone to appreciate the position of members of that profession.

The National Health Insurance Act has not been an unqualified success, and any scheme grafted on this will not meet with the undivided support of the medical profession.

The faults in the Insurance Act are many:—1. It treats the rural practitioners similarly to the urban, though the conditions of practice are essentially different in the two cases. 2. The costs of administration are too large for the benefits given. Many men outside the medical profession draw larger salaries than the practitioners who do the work. This last objection would be removed if these posts were filled by medical men incapacitated by the war from taking a part in the wear-and-tear of general practice. 3 The Insurance Committees have not protected the profession from the mean people whose income is *above the limit*, although this could have been done by a reference to the surveyor of taxes. 4. The question of inflation. My Insurance Committee admits that there are more patients on the panel in this county than they receive subscriptions for, and therefore do not pay the full capitation fee. This is not the fault of the doctors, yet they are liable to provide professional attention to every person for whom the Insurance Committee has issued a card. 5. Delay in settlement of accounts. In November, 1918, I received cheque in settlement of 1917 account.

All these difficulties must be overcome if any use is to be made of the machinery of the Insurance Act. Personally I advocate the scrapping of the Poor-law Medical Services and the Health Insurance Act, and that the whole service, under whatever scheme is adopted, be organised by the existing Public Health Service in the different counties and boroughs.

The idea which most appeals to me is that of Sir Bertrand Dawson—i.e., "team-work."

This scheme in the towns would go far towards achieving the objects we all desire. It would save the time both of doctors and patients, because under this scheme we should arrive at a correct diagnosis with the least possible delay; the doctors might even have some chance of an "eight-hour day," and why not? Even in rural districts the organisation of a "team service" of motor ambulances and laboratories should be a possibility which could be realised for the collection of patients and specimens to be taken to the base or clinic with notes from the general practitioner.

This brings us to the question of remuneration as the scheme to be successful must be generously endowed.

It has been suggested that any scheme the Government may introduce must result in a loss of income to the profession. I do not believe this to be the case, because we all know under present conditions how many people get more than their money is worth owing to the human sympathy of the great majority of the profession. In our dealings with the State through the Ministry of Health no such consideration is demanded. The State has the money; after the armistice was signed—but before the General Election—wages were raised 5*s.* a week in consideration of the increased cost of living.

What did the State do for the doctors during the war? The fee for the notification of infectious diseases was reduced from 2*s.* 6*d.* to 1*s.* The State has the money, and if the popular principle of "nothing for nothing" were adopted in the case of the medical profession the average income would be increased rather than diminished. This involves the State control of all charitable institutions. The medical and surgical staffs of these institutions would be paid either on a whole-time basis or by a definite fee for each operation or consultation.

Mr. Lloyd George has said every man should have a fair return for what he has to offer. In many cases the physician or surgeon offers life. What is it worth? In the case of the specialist recognised as able to render valuable service to the State is it not worth the £5000 a year of a Cabinet Minister or a judge? The position of the general practitioner is not so straightforward, but I state my view frankly that every capable general practitioner by the time he is 40 years old should be able to earn an income of £1000 per annum free of *all* expenses in the earning thereof.

There are objections to a whole-time district medical officer:—

1. It interferes with the independence of the doctor and the patient. 2. It tends to diminish the competitive element and the personal equation. Many general practitioners owe their success in practice not to academical attainments, but to personal qualities not correctly estimated in the examination room.

We have all had a good deal of registering to do lately, so that it would not be an innovation or hardship if some such method were adopted as the following:—

Every general practitioner recognised by the State to be paid a retaining fee, say £300 per annum, as compensation for the time and money expended on his education which the State expects to utilise and has never endowed in any way. Every person included in the scheme must register with the doctor of his choice. The doctor to be paid for services rendered, on a fixed scale, from funds collected and administered by one central body, and provided by a special tax or by an addition to the income set aside for this purpose. In this way the delay in meeting the doctors' accounts should be obviated. The question of mileage might be met by the grant of free petrol on the basis of existing petrol licences.

Finally, who is to be allowed to take advantage of this scheme, and where is the line to be drawn? I would suggest that as the Government has failed in the past to protect the profession from imposition by those above the wage-limit, it will not be able to do so in the future; the profession must therefore insist on a remuneration which will cover every class of society, and every member of society will be able to avail themselves of the Government system if they think it good enough.

The whole question of a successful National Medical Service appears to me to depend on the answer to the question of "What is it worth?" Can Mr. Lloyd George answer this question?—I am, Sir, yours faithfully,

Great Bookham, Surrey, Feb. 11th, 1919. G. SPENCE CANDY.

X RAYS IN THE DIAGNOSIS OF APPENDICITIS.

To the Editor of THE LANCET.

SIR,—The exhaustive paper by Dr. E. I. Spriggs on this subject in your issue of Jan. 18th should serve as an encouragement to physicians and surgeons to seek the assistance of the radiologist in obscure abdominal conditions, and as a stimulus to the radiologist himself to cast more widely his diagnostic net. On the technical side there

are points of detail in Dr. Spriggs's paper the carrying out of which would involve, at any rate in London, some amount of inconvenience, if not actual difficulty. The first is the supply of buttermilk for the special meal described. Fortunately, this particular meal is not necessary to demonstrate the appendix, although it is true that the ordinary mixture of bread and milk and barium often fails. I have now for two years used the meal introduced by Dr. James Metcalfe, and put up by Messrs. Allen and Hanburys under the trade name of "umbrose." In this the barium is very finely triturated and intermixed with the other ingredients, and probably for this reason has no difficulty in entering the appendix. A second point is that Dr. Spriggs states that the best view of the appendix is obtained 12–14 hours after the meal. Now, as a rule, one wishes to examine the stomach with the same meal. I have found personally that if the meal be given at 10 A.M., the appendix will be satisfactorily seen between 4 and 6 o'clock in the afternoon, or the next morning. In consulting-room practice the 12–14 hour examination is impossible as a routine, though it may be necessary to arrange for it in a few special cases. Lastly, those whose outfits do not permit of radiographing the appendix in less than one second should not be discouraged from examining it, as, although failure will occur in a few cases, in the majority reliable data will be obtained. With regard to the "numerous photographs" said to be necessary, a careful screen study is often of as much, or more, value, two or three plates being taken as a record at each examination. With the technique modified as above, there seems no reason why the X ray examination of the appendix should not be generally carried out.

As to the desirability of radiographic investigation of the appendix, a striking feature of the cases quoted by Dr. Spriggs is that few or none were suspected of having appendix trouble. Their ill-health had been ascribed to various causes other than this. Herein the present writer's experience coincides with that of Dr. Spriggs. I have frequently had cases sent to me for examination of the lungs or of the kidneys where the trouble ultimately proved to be appendicular. If a man should say that in all cases of chronic and unexplained ill-health the appendix should be investigated by X rays, perhaps he might be suspected of monomania; and yet his madness would not be without method.

I am, Sir, yours faithfully,

Harley-street, W., Feb. 4th, 1919. F. HERNAMAN-JOHNSON.

THE PRESENCE OF A FILTER-PASSING VIRUS IN INFLUENZA, ETC.

To the Editor of THE LANCET.

SIR,—I have read with interest the preliminary report by Major-General Sir John Rose Bradford, Captain E. F. Bashford, and Captain J. A. Wilson, published in your issue of Feb. 1st, on a filter-passing virus found in certain diseases, the more so as it appears to lend support to the claim originally advanced by Nicolle and Lebailly that influenza, one of the diseases specifically mentioned in that report, is due to a filterable virus. If this be further substantiated by others, it follows that Pfeiffer's bacillus, as that is usually understood and described, can no longer be looked upon in the light of a responsible etiological factor. In a letter[1] expressing disbelief in the claims made by the advocates of Pfeiffer's bacillus, I ventured to state that we had to deal, not with a double infection, primary and secondary, but with one infective agent only and that a pleomorphous one of which I gave a brief description in a letter to THE LANCET of Nov 23rd, 1918.

Since writing these letters my attention has been drawn by a private correspondent to certain experimental work carried out by Rosenow[2] and others, working on acute epidemic poliomyelitis in America. I was unaware of the existence of this work at the time of writing but have since been able to gain access to some of Rosenow's articles. I have been struck with the extraordinary resemblance between his organism and the one which I have already described and to which I have given the provisional name of organism "D." Whether Rosenow's organism is exactly identical or not with organism "D" I am unable to say, as all Rosenow's data are not available at present to me. It is well known, however, that Flexner and Noguchi were able to reproduce acute poliomyelitis by the inoculation of a filter-passing virus, consisting of small "globoid" bodies. Rosenow and his co-workers have since been able to transform pure cultures of these globoid bodies, obtained from Noguchi's laboratory, into the pleomorphous organism which they claim is the cause of acute poliomyelitis. Not only so, but they have been able to grow their organism in the form of the Flexner-Noguchi "globoid" bodies.

In my letter of Dec. 21st, 1918, already referred to, I stated that the claim which I there made did not necessarily exclude the possibility of there being a filter-passer phase of organism "D." It seems necessary to emphasise this, in view of the accumulating evidence that influenza can be produced by a filterable virus. When once it has been proved that a given infective agent is a filter-passer it has been the custom to argue that other organisms, of ordinary size, which may previously have been regarded as the causative agents, are merely contaminations or secondary invaders. This argument is obviously fallacious unless and until it be proved beyond any question of doubt that the filterable virus can exist in no other form. It is just as fallacious as the argument that pleomorphism is a synonym for impurity of culture. It will be granted at once that in some cases such has been proved to be the case, but that pleomorphism does exist has been sufficiently well established by modern bacteriological methods.

In connexion with Rosenow's and my own claim it is of interest to refer to a letter which appeared in THE LANCET on Jan. 11th from the pen of Dr. F. G. Crookshank, in which the latter claims that, on epidemiological grounds, there is reason for believing that acute poliomyelitis, encephalitis lethargica, and influenza are so closely related as to constitute different group manifestations of a single infective agent. Such a view has much to commend it, and is at least quite as acceptable as that which, while the causes of these diseases are still in doubt, claims that encephalitis lethargica and poliomyelitis are to be regarded as two distinct diseases.

May I be allowed to add, in conclusion, a few further particulars for the benefit of those who may have been stimulated by my previous letters to look for organism "D"? The latter grows well at room temperature, does not liquefy gelatin, and produces acid without clot in milk. It forms acid in dextrose, lactose, maltose, saccharose, raffinose, and dextrin litmus peptone water. There is also an indication that the organism has some connexion with the Pasteurella group, but a definite statement on this point cannot be made at present.

I am, Sir, yours faithfully,

Reading, Feb. 4th, 1919. ROBERT DONALDSON.

[1] Brit. Med. Jour., Dec. 21st, 1918.

[2] Journal of Infect. Diseases, Chicago, vol. xxii., No. 4, pp. 281 et seq.

PARASITIC MANGE IN HORSES

To the Editor of THE LANCET.

SIR,—In July of last year I was instructed by the Joint Propaganda Committee—Board of Agriculture and Ministry of Food—to draw your attention to the prevalence of parasitic mange in horses and the likelihood of its spreading in the coming months; also to the issue by the Joint Committee of a special leaflet (No. 8) in which particulars were given (*a*) as to the Orders in existence in regard to the disease; (*b*) the penalties attached to breaches of the Orders; (*c*) means whereby the disease can be prevented, discovered, and treated.

Since the issue of this leaflet (No. 8) two additional leaflets on the same subject have been published which have had a very wide circulation.

We are informed that the local authorities view with growing anxiety the increasing prevalence of mange in horses reported in the returns furnished by them. Further, there are grounds for believing that the disease exists in many districts to a much greater extent than is revealed in the returns furnished. The Committee would like to point out the serious effect the disease has in decreasing the usefulness of the horse. These facts are the justification for the Joint Committee again asking you for the kind hospitality of your columns to make the existence of our leaflets as widely known as possible and to state that copies can be had free and post free on application.

I am, Sir, your obedient servant,

J. NUGENT HARRIS,
Secretary, Joint Committee, Board of Agriculture and Ministry of Food.

6A, Dean's-yard, Westminster, S.W.1, Feb. 8th, 1919.

INFLUENZA AND CHRONIC LUNG DISEASE.

To the Editor of THE LANCET.

SIR,—Whilst temporarily transferred for duty to Maitland Military Hospital, Cape Town, where there were upwards of 600 cases of influenza of every variety, I noticed that patients with a previous history of chronic catarrhal conditions of the lungs bore the disease well. On my return to Tempe, where the epidemic was very severe, I found this observation confirmed in the survival of all but 4 of 46 tuberculous patients, most of whom had contracted the disease. Two of these, however, were in the last stages of consumption before I left them, and I may add that many of those who recovered from the influenza attack were almost as bad. Of 27 natives suffering from glandular and pulmonary tuberculosis 4 died, and these were also cases of a desperate type. Further, 6 white patients with asthma and chronic bronchitis all contracted influenza and recovered without any complications.

It seems, therefore, fair to conclude that chronic catarrhal conditions of the lungs, even when associated with so formidable a disease as tuberculosis, confer a certain degree of protection against this disease. I shall be interested to know whether others better qualified than myself to judge have had a similar experience.

I am, Sir, yours faithfully,

DUNCAN MACKENZIE MACRAE, M.A., M.B., Ch.B.,
Captain, S.A.M.C.

Tempe, Bloemfontein, Dec. 13th, 1918.

THE MINISTRY OF HEALTH.

To the Editor of THE LANCET.

SIR,—The reports of meetings which have been held in order to support the formation of a Ministry of Health are proof that those who attend them know very little of the work which has been performed under present conditions. The Health Service in this country has given the lead to every other country in the world, and as the result, a large number of persons are attempting to pull down the foundations upon which the work has been carried out. The desirability of decentralisation, and not centralisation of power under politicians' régime, is the real problem. Now the political party dominant is apparently that of the working class, and the question arises, Has this party ever shown any desire to promote the interests of medical science? It was largely responsible for the introduction of the conscientious objector into the Vaccination Acts, and as a result vaccination against small-pox has become more and more a dead-letter. There is no guarantee that when health matters become more centralised and under political control the presence of politics will not again interfere with important safeguards against disease.

The present position with regard to venereal diseases is most unsatisfactory. These diseases are of the type of virulent infective disease, and the obvious course to be pursued is to make them notifiable under the Public Health Act and to leave them under the authority of the local councils. Politics must be considered, and therefore palliative measures are to be adopted and not measures sufficiently strong to stamp out the disease—a matter of no great difficulty from the practical scientific point of view.

The work performed by the Local Government Board and Home Office has, on the whole, been of a very high order, and I do not suppose that either Office has ever neglected to give sufficient support to medical officers of health in the carrying out of their duties. After more than 30 years of service as medical officer of health, one notice to quit, and a triumphant re-election owing to loyal support from the Local Government Board, I have had sufficient experience to be quite satisfied with the conditions under which I have worked. The troubles which most perplex medical officers of health are often caused by local politics, and I apprehend that worse will be in store for them when politicians of the Labour party are in power at the Ministry of Health.

One of the most difficult problems at the present time is that of housing, and this trouble has been the direct result of a popular land budget—passed by some politicians for the advantage of their party machine.

I am, Sir, yours faithfully,

Feb. 6th, 1919 LOVELL DRAGE.

THE MEDICAL PARLIAMENTARY COMMITTEE:

A DINNER TO MEDICAL MEMBERS OF PARLIAMENT.

A DINNER, presided over by Sir W. WATSON CHEYNE, M.P., was given by the Medical Parliamentary Committee at the Café Royal, Regent-street, on Wednesday evening, Feb. 12th, to the medical Members of Parliament, when Dr. ADDISON, President of the Local Government Board, replying to the Toast of "The Guests," made a very free and frank statement with regard to the Bill erecting a Ministry of Health for England, Wales, and Scotland. He compared the differences of opinion manifested by various existing medical bodies to teething troubles, and said that he had no doubt that a way would be found to some form of organisation. The Bill, he said, would be immediately read for the first time, printed, and circulated, and he declared that it was the intention of the Government to consult the different representative organisations at the present juncture, and to make of the Advisory or Consultative Councils, which will be an essential part of the Bill, *bonâ fide* bodies, real and hard-working.

Sir BERTRAND DAWSON, speaking to the toast of "The Unity of the Medical Profession," said that the Ministry of Health was arriving, and would find the medical profession imperfectly organised to meet the situation.

Mr. E. B. TURNER, responding to this toast, said that though he had much experience of public speaking, this was the first time in which he had been asked to reply for a thing which was non-existent, but he urged the medical profession to get their best energies to work, and to work together like a good football team. Colonel HURRY FENWICK, who also spoke to Sir Bertrand Dawson's toast, agreed with Mr. Turner in finding unanimity in the medical profession remarkably absent.

Sir JAMES GALLOWAY proposed "The Medical Parliamentary Committee" in a thoughtful address upon the existing state of medical politics, and the CHAIRMAN replied in terms that justified the activities now being displayed by the Committee.

Preliminary to the speeches Dr. ARTHUR LATHAM read a brief statement setting out the objects before the Medical Parliamentary Committee. The statement showed that the Medical Parliamentary Committee consists of specially nominated representatives of a number of existing medical organisations and of non-official members, a large proportion of whom are engaged in different types of practice. The Committee is a temporary body having as its primary object the drawing up of a scheme under which there might come into being some council or committee representative of every section of medical thought.

Among others present at the dinner were Vice-Admiral Sir W. Norman, Lieutenant-General Sir John Goodwin, Major-General M. H. E. Fell, Sir Robert Morant, Dr. T. H. C. Stevenson, Lady Barrett, Sir Robert Woods, M.P., Sir William Whitla, M.P., Captain W. E. Elliot, M.P., Colonel Nathan Raw, M.P., Dr. Bouverie McDonald, M.P., Dr. R. Murray, M.P., Major J. E. Molson, M.P., Major Waldorf Astor, M.P., Sir W. Hale White, Sir Thomas Oliver, Dr. Jane Walker, Major J. F. Gordon Dill, Professor Kenwood, Dr. G. E. Haslip, and Mr. J. Y. W. MacAlister.

NEW PUBLIC HEALTH REGULATIONS FOR THE CONTROL OF EPIDEMIC DISEASE.—The Secretary of the Local Government Board has circulated to sanitary authorities and medical practitioners a general order (P.H. 2A. 1919) containing the Public Health (Pneumonia, Malaria, Dysentery, &c.) Regulations, 1919, and a circular (P.H. 2) explaining these regulations. Their object is to secure better control over certain epidemic diseases prevalent or threatened at the present time and to increase the facilities for their treatment. The regulations impose the duty of notification by practitioners of any cases of pneumonia occurring under their care, if primary or the result of influenza. All cases of malaria, dysentery, and trench fever must be notified unless the practitioner knows that this has been done in the same district within six months. The regulations in regard to the handling of food by carriers are extended to the enteric fevers, and the duties in relation to lice-borne disease to typhus and relapsing fever. Local authorities may provide medical assistance for any of the diseases named in the regulations, which are to come into force on March 1st.

Medical News.

THE late Lord Rhondda has, among other bequests, left £20,000 to the Cardiff Infirmary.

TUBERCULOSIS SOCIETY.—A conference of tuberculosis officers in the United Kingdom will be held to-day, Saturday, Feb. 15th, at 4 P.M., at the Royal Society of Medicine, 1, Wimpole-street, W., to consider a scheme for the National Prevention and Treatment of Tuberculosis.

Major Thomas Reginald St. Johnston (District Medical Officer and District Commissioner, Fiji) has been appointed by the King to be Colonial Secretary of the Falkland Islands.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At the monthly meeting, held on Feb. 3rd, Major-General Sir William B. Leishman, K.C.M.G., C.B., F.R.S., was admitted an Honorary Fellow.—At the same meeting the following were admitted as ordinary Fellows: Dr. Donald MacPhail (Coatbridge) and Dr. John Nairn Marshall (Rothesay).

ASTLEY COOPER PRIZE, GUY'S HOSPITAL.—This prize has not been awarded for 1916-1919 by the trustees, the physicians and surgeons of Guy's Hospital. The subject set was "Gunshot Wounds of the Lungs and Pleura," and the unsuccessful essays will remain at the museum of Guy's Hospital until claimed by the authors by letter to Mr. C. H. Fagge, honorary secretary of the trustees.

RETIREMENT OF PROFESSOR J. B. HELLIER.—Dr. E. O. Croft has been appointed to succeed Professor J. B. Hellier in the Chair of Obstetrics in the University of Leeds. Dr. Hellier's long association with the Leeds Medical School, both as teacher and adviser on questions of policy, has been an important factor in its successful development. The council has passed a resolution expressing its high appreciation of the services he rendered to the University successively as demonstrator, lecturer, professor, and dean of the faculty of medicine.

ROYAL INSTITUTION.—On Tuesday next, Feb. 18th, at 3 o'clock, Captain G. P. Thomson will give the first of two lectures at the Royal Institution on "Aeroplanes in the Great War." On Thursday, Feb. 20th, Professor H. M. Lefroy will give the first of two lectures on "Insect Enemies of our Food Supplies"; the second on Thursday, Feb. 27th, on "How Silk is Grown and Made." The Friday evening discourse on Feb. 21st, at 5.30 o'clock, will be delivered by Mr. A. T. Hare on "Clock Escapements"; on Feb. 28th by Professor J. A. McClelland on "Nuclei and Ions." On Saturday, Feb. 22nd, at 3 o'clock, the Hon. J. W. Fortescue will give the first of two lectures on "The Empire's Share in England's Wars."

THE LATE PROFESSOR GEORGE CAREY FOSTER.—The death is announced of Professor G. Carey Foster in his 84th year. He was appointed to the chair of physics at University College, London, in 1865, from which he retired in 1898. He began his professional career as a student of chemistry, but found the borderland between that science and physics of peculiar attraction, and his work in this direction did much to show how interdependent chemical and physical phenomena are. When we recollect the advances that have been made in bio-chemistry in recent years, we must realise that the study of the physical side of chemistry, or the chemical side of physics, has added considerably to the sum of knowledge on the working of the human machine. Professor Carey Foster will be remembered by British scientific men as one who worked hard to make the British Association for the Advancement of Science a successful organisation in its early days.

LONDON INTER-COLLEGIATE SCHOLARSHIP BOARD: ENTRANCE SCHOLARSHIPS AND EXHIBITIONS.—Thirty-one scholarships and exhibitions of an aggregate total value of about £3075, open to both sexes, and tenable in the faculties of arts, science, medical sciences, and engineering of University College, King's College, East London College, and Bedford College, will be offered for competition on May 13th next. Seventeen medical entrance scholarships and exhibitions of an aggregate total value of about £1550, tenable in the faculty of medical sciences of University College and King's College and in the medical schools of Westminster Hospital, King's College Hospital, University College Hospital, the London (Royal Free Hospital) School of Medicine for Women, and the London Hospital, will be offered for competition on July 15th next. Full particulars on application to the secretary of the board, Mr. S. C. Ranner, M.A., Medical School, King's College Hospital, Denmark Hill, London, S.E. 5.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY, Feb. 20th.—Papers:—M. Jean Dufrenoy: Note on the Metabolism of the Glucosides of the Arbutin Group (communicated by Prof. A. R. Cushny).—Dr. S. S. Zilva and Mr E. M. Wells: Dental Changes in the Teeth of the Guinea-pig produced by a Scorbutic Diet (communicated by Dr. A. Harden).—Dr. W. E. Bullock and Dr. W. Cramer: On a New Factor in the Mechanism of Bacterial Infection (communicated by Prof. W. Bulloch).—Major W. J. Tulloch: The Distribution of the Serological Types of *B. tetani* in Wounds of Men who received Prophylactic Inoculation, and a Study of the Mechanism of Infection in, and Immunity from, Tetanus (communicated by Major-General Sir David Bruce).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.1.

Tuesday, Feb. 18th.

SPECIAL GENERAL MEETING OF FELLOWS, at 5 P.M.

To consider and, if approved, to confirm the following Resolution passed by the Council:—

"That the necessary steps be taken to increase the Subscription of Fellows living or practising within one mile of the Society's House from Three Guineas to Five Guineas."

Ballot for Election to the Fellowship. (Names already circulated.)

Wednesday, Feb. 19th.

SOCIAL EVENING: at 8.30 P.M.

Dr. Norman Moore (President, Royal College of Physicians) will discourse on "English Morbid Anatomists."

MEETINGS OF SECTIONS.

Wednesday, Feb. 19th.

HISTORY OF MEDICINE (Hon. Secretaries—Charles Singer, Arnold Chaplin): at 5 P.M.

Paper:

Mrs. Singer: A Survey of the Medical Manuscripts of the British Isles.

Friday, Feb. 21st.

OTOLOGY (Hon. Secretaries—J. F. O'Malley, H. Buckland Jones): at 5 P.M.

Paper:

Mr. J. S. Fraser: The Radical and Modified Radical Mastoid Operation.

Mr. Hunter Tod: Accidental Injury of Lateral Sinus during the Operation of Mastoidotomy.

Members are requested kindly to send cases typical of the operations described, at 4 P.M.

ELECTRO-THERAPEUTICS (Hon. Secretaries—Robert Knox, Walter J. Turrell): at 8.30 P.M.

Paper:

Mr. W. Sampson Handley: On the Mode of the Spread of Cancer in Relation to X-Ray Treatment.

The Royal Society of Medicine keeps open house for R.A.M.C. men and M.O.'s of the Dominions and Allies. The principal hospitals in the metropolis admit medical officers to their operations, lectures, &c. Particulars on application to the Secretary at 1, Wimpole-street, London, W.1.

ROYAL STATISTICAL SOCIETY, 9 Adelphi-terrace, Strand, W.C. 2.

TUESDAY, Feb. 18th.—5.15 P.M., Paper:—Capt. M. Greenwood, R.A.M.C.(T.): Problems of Industrial Organisation.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

FRIDAY, Feb. 21st.—5.30 P.M., Papers:—Dr. J. A. Arkwright, Mr. A. Bacot, and Mr. F. M. Duncan: The Minute Bodies (Rickettsia) found in Association with Trench Fever, Typhus and Rocky Mountain Spotted Fever.—Sir Stewart Stockman: Pathology and Epizootiology of Louping-ill, with Special Reference to Chromatin Bodies in the White Corpuscles.—Mr. C. Bonne (Paramaribo) (read by Dr. Bagshawe): Has Emetine any Influence on the Schistosomes?

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, in the Theatre of the College, Lincoln's Inn Fields, W.C.

MONDAY, Feb. 17th.—5 P.M., Prof. E. S. Schlesinger: The Treatment of Compound Fractures and other Severe Injuries of the Upper Limb.

WEDNESDAY.—5 P.M., Arris and Gale Lecture:—Mr. E. M. Corner: The Nature of Scar Tissue and Painful Amputation Stumps.

FRIDAY.—5 P.M., Arris and Gale Lecture:—Lieut.-Col. E. M. Cowell, D.S.O., R.A.M.C.(S.R.): The Initiation of Wound Shock and its Relation to Surgical Shock.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

Special Eight Weeks' Course of Post-Graduate Instruction (First Week):—

MONDAY, Feb. 17th.—10 A.M., Dr. S. Pinchin: Demonstration on Medical Cases in the Wards. 2 P.M., Operations. Mr. Baldwin: Surgery. 3 P.M., Mr. B. Harman: Diseases of the Eye. 4.30 P.M., Mr. Addison: Surgery. 5.30 P.M., Venereal Diseases Clinic.

TUESDAY.—2 P.M., Operations. Mr. Pardoe: Genito-Urinary Diseases. 3 P.M., Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. 4.30 P.M., Mr. T. Gray: Surgery. 5.30 P.M., Venereal Diseases Clinic.

WEDNESDAY.—10 A.M., Operations on the Throat, Nose, and Ear. 2 P.M., Operations. Col. Armour: Surgery. 3 P.M., Dr. Simson: Diseases of Women. 4.30 P.M., Dr. Beddard: General Medicine. 5.30 P.M., Venereal Diseases Clinic.

THURSDAY.—2 P.M., Operations. Dr. Saunders: General Medicine. 3 P.M., Dr. S. Pinchin: General Medicine. 4.30 P.M., Dr. G. Stewart: Diseases of the Nervous System. 5.30 P.M., Venereal Diseases Clinic.

FRIDAY.—2 P.M., Operations. Dr. Morton: Radiography. 3 P.M., Dr. Pernet: Diseases of the Skin. 4.30 P.M., Major Pritchard: Clinical Pathology. 5.30 P.M., Venereal Disease: Clinic.

UNIVERSITY OF LONDON, KING'S COLLEGE, AND KING'S COLLEGE FOR WOMEN.

Course of Six Public Lectures arranged in conjunction with the Imperial Studies Committee of the University on Physiology and National Needs:—

WEDNESDAY, Feb. 19th.—5.30 P.M., Lecture III.:—Prof. F. G. Hopkins: Vitamines, Unknown but Essential Accessory Factors of Diet.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON), at the Lecture Theatre of the Medical School, King's College Hospital, Denmark Hill, S.E.

Course of Four Lectures on Malaria. Microscopic specimens and lantern slides will be shown at this lecture.

FRIDAY, Feb. 21st.—12 noon, Lecture IV.:—Col. Sir Ronald Ross, K.C.B., K.C.M.G., F.R.S. Officers and Men of the Royal Army Medical Corps are invited to attend.

ROYAL INSTITUTE OF PUBLIC HEALTH, in the Lecture Hall of the Institute, 37, Russell-square, W.C.

Course of Lectures and Discussions on Public Health Problems under War and After war Conditions:—

WEDNESDAY, Feb 19th.—4 P.M., Mr. P. C. Varrier-Jones: The Future of the Tuberculosis Problem.

Vacancies.

For further information refer to the advertisement columns.

Birkenhead Borough Hospital—Jun. H.S. £170.
Birkenhead and Wirral Children's Hospital, Woodchurch road.—H.S.
Brighton, Royal Sussex County Hospital.—Jun. H.S. and Asst. H.S. £80.
Burton-upon-Trent County Borough Asst. M.O. £350.
Coventry and Warwickshire Hospital—Res. H.P. £200.
Derbyshire County Council—Venereal Disease Officer.
Dorchester, Dorset County Asylum—Second Asst. M.O. £300.
Dudley, Guest Hospital and Eye Infirmary—Asst. H.S. £120.
Fulham, Metropolitan Borough. Female Asst. M.O. £500.
Glasgow Eye Infirmary.—Res. Med. Supt. and H.S. £300.
Gravesend Hospital, Kent.—Locum H.S. £1 1s. per day.
Herefordshire General Hospital.—Hon. P.'s and Hon. S.'s.
Huddersfield Royal Infirmary.—Jun. H.S. £100.
Lancaster County Asylum.—Temp. Asst. M.O. 7 gs. per week.
Leeds Hospital for Women and Children.—Hon. Asst. S.
Leicester Royal Infirmary—Hon. S. Also H.S. £250.
Liverpool, Brownlow Hill Poor Law Hospital.—Res. Asst. M.O. £300.
Liverpool Eye and Ear Infirmary—Hon. Asst. Surgeons.
London County Mental Hospitals, (a) Bexley, Kent, (b) Long Grove, Epsom, Surrey.—Temp. Asst. M.O. 7 gs. a week.
Northampton General Hospital.—Jun. H.S. £150.
Maidstone, Kent County Ophthalmic Hospital—Ophth. S.
Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Res. M.O. £200.
Middleton-in-Wharfedale Sanatorium, nr. Ilkley.—Asst. Res. M.O. £325.
Reading, Royal Berkshire Hospital.—H.P. £250.
Rousay and Egilshay, Orkney, Parish of.—M.O. £300.
Royal London Ophthalmic Hospital, City-road, E.C.—Asst. S. Also Sen. H.S. £150.
Royal National Orthopædic Hospital.—Res. H.S. £100.
Serbia Hospital.—S.
Shantung Christian University Medical School (Tsinanfu, N. China).—Medical Missionaries.
Sheffield Royal Hospital.—Cas. O. £130. Also Asst. H.P. £120.
Smethwick County Borough.—M.O.H. £800.
Southend-on-Sea County Borough Education Committee.—School Dentist. £370.
Stoke-on-Trent County Borough.—Temp. Tuberc. O. £550.
Sunderland Royal Infirmary, Children's Hospital.—Res. M.O. £200.
Taunton, Taunton and Somerset Hospital.—Sen. H.S. £250.
Tunbridge Wells General Hospital.—H.S. £160.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Wolston (Warwick), Clevedon, Sheffield, Ballyward, and at Braemar.

Births, Marriages, and Deaths.

MARRIAGES.

MACDONALD—SPEIRS ALEXANDER.—On Feb. 1st, at St. Paul's Church, Portman-square, W., Sydney Gray MacDonald, M.A., M.B., B.C. Cantab., F.R.C.S., to Mary Martineau Speirs-Alexander (May), widow of Captain A. R. Speirs-Alexander, I.M.S.

DEATHS.

ARCHER.—On Feb. 10th, at his residence at Barnes, after a short illness, Thomas Archer, M.D., C.M. McGill, L.R.C.P. & S. Edin.

BELL.—On Feb. 3rd, at Hastings, James Vincent Bell, M.D., F.R.C.S., of Rochester, aged 80 years.

KHORY.—On the 5th Feb., at 249, Hackney-road, E.2, Susan, the beloved wife of Dr. K. N. Khory, after a long illness.

KITSON.—On Feb. 6th, at The Lodge, Beaminster, Dorset, Francis Parsons Kitson, M.R.C.S., L.R.C.P., aged 54.

NESHAM.—On Feb. 5th, at Ellison-place, Newcastle-upon-Tyne, Robert Anderson Nesham, F.R.C.S., L.R.C.P.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

PHYSIOLOGY AND THE FOOD PROBLEM.

LAST year at King's College a series of free lectures were delivered by well-known professors from representative Universities of the country on the important part which zoology had played in the service of the Empire during the war. The series is being continued this year with the object of showing how the needs of the nation are being served by physiology, and on Feb. 5th Professor W. D. Halliburton, F.R.S., delivered the introductory address, taking for his text Physiology and the Food Problem. Beginning with a general survey of the relation of physiology to daily life, Professor Halliburton said that hygiene and pathology were the direct practical outcome of physiological knowledge. Science had contributed to the other side of warfare, but the physiologist and the physiological chemist had stepped in to alleviate distress; for example, the deadly chlorine gas had become in their hands the basis of new antiseptics. During the war medical research had progressed rapidly, and this progress ought not to be allowed to slacken during the period of reconstruction. Instead of spending millions a day on war, the Government must be prepared to expend a few thousands a year in the endowment of research. For the first time in the history of war biologists and physiologists had been called upon to do national work, and the present Cabinet, although it contained no physiologist, had anatomists at the head of two important departments—Dr. Addison and Sir Auckland Geddes—a good augury that science at last was coming into its own. The Medical Research Committee had issued a medical supplement giving extracts from foreign medical publications relating to the work done in other countries during the war, and he hoped that these supplements would be continued, and would increase in usefulness during the time of peace. But, he added, such publications require State help. Other scientific committees had been formed, not the least important of which was the Food War Committee of the Royal Society. Principles had been laid down upon which food legislation should proceed, and numerous statistics had been collected which would be of incalculable value to those who would in the future be engaged in the administration of food. Much investigation had been done, but much remained to be discovered, especially as regards the effect of the various types of food in producing energy for different kinds of work. As an instance of the investigations which had been carried out, Professor Halliburton said that about the middle of 1917 the fat shortage became serious because so much was being used in the manufacture of explosives. After the extraction of glycerine from the fat the fatty acids remained, and the question arose as to whether it would be possible to employ these acids for the various purposes for which fats were previously used. The Royal Society Subcommittee was asked whether these substances could be employed as the component part of some butter substitute. The first experiments were made upon rats. These animals were comparatively short-lived, and if they were fed on a particular diet for a few weeks or months it was equivalent to feeding a long-lived animal, such as a man, over a longer period. On a diet of fatty acids the rats thrived and multiplied, and it remained to try the effect of the food upon man. Professor Noel Paton obtained voluntary assistants for the test and the experiment proved a complete success. There was as yet no need for a diet of this kind, but in case of emergency a source of a supply for fat was here indicated. A curious fact came out in these experiments. It was found that if an animal were fed upon fatty acids they passed into the blood stream as fat, the animal making its own glycerine, possibly from sugar. Owing to British enterprise, the manufacture of margarine had now greatly increased, this success being, to a large extent, due to the fact that British firms had been able to give it an agreeable flavour. The prejudice against its use had practically died out, but it must be remembered that the great mass of margarine was made from vegetable fats. Animal fats had the same energy value as butter, and animal margarines, with few exceptions, contained vitamines, which were not present in the more palatable vegetable margarines. If, therefore, the children of the poor lived exclusively on vegetable margarine we should be running a great risk of becoming a C3 nation. Although vegetable oils did not contain vitamines, green vegetables did, but they were not suitable as a food for infants, and if there was a shortage of milk the babies must have the lion's share. A pure milk-supply was essential. This had been secured in America and Australia, and it was time that the mother country protected the lives of her children in the same way. He hoped that under a Ministry of Health

the question would no longer be neglected. Pure milk would save the lives of hundreds of thousands of infants. Other questions which came before the Royal Society Subcommittee related to the methods to be employed for saving fat and to the value of cocoa butter, which, though it was quite good, was perhaps not so digestible as ordinary butter. The Government had some thousands of tons of lanoline in stock, and information had been asked for as to whether this could be used for food. It had an entirely different chemical constitution from fat; it was not poisonous, but was quite useless for food on account of its non-digestibility. The object of the lecture was, Professor Halliburton said, to illustrate the work which had been done by subcommittees in regard to bread, meat, &c., which work formed the backbone of legislation and enactments by the food controllers.

Sir Alfred Keogh, who presided, thought that this war was the only one in which, in all its departments, the Government had endeavoured to avail itself of the resources of science. He would like to point out that the physiologist had been doing work for the Army for a great many years. After the South African War the ration of the British soldier was tested and found to be deficient, the men losing weight and spirits when on the march. On the advice of the physiologist additions of jam, cheese, and bacon were added, to increase the fat, protein, and carbohydrate content, with the result that a satisfactory ration was obtained. This ration was used throughout the present war, and, in his opinion, was largely instrumental in bringing about that absence of disease which had been so noticeable.

A DROPPED-FOOT APPLIANCE.

Mr. Frank Jenner has been prompt in meeting our criticisms on his dropped-foot appliance (THE LANCET, Jan. 25th, p. 142). He has submitted to us an improved apparatus in which the hooks are considerably strengthened and the strap which takes the resistance to the springs is placed round the heel of the boot instead of pressing unduly upon the Achilles tendon.

HEALTH AND ALLOTMENTS.

THE tilling of the soil and the tending of cattle together form one of the oldest occupations of man and one of the healthiest, provided the conditions of labour are propitious; for it must be remembered that undue exposure to inclement weather does not conduce to health. Other things being equal, work in the open air tends to prolong life, and in spite of worries over bad harvests, failure of crops, and anxiety as to the state of the weather, the farmer and the gardener are notoriously healthy and long-lived. All men cannot be farmers or gardeners, but very many may have the opportunity of cultivating a garden, however small, if they will; the war has made the increase of the allotments a national necessity, and we hope this will become a permanent feature of English life. Apart from the undoubted physical benefits which result from work in the open air, the allotment is a place eminently suited to exorcise the worries induced by the rush of modern business life, by quiet contemplation, or congenial intercourse with sympathetically inclined plot-holders; the dispersion of worry is a secret of long life more potent than drugs. The various occupations of digging, hoeing, and raking, the general care of the land, and the taking home of produce bring into operation all the muscles of the body, while the worker has every inducement to rise early and partake of the invigorating morning air. We are only concerned here with the medical aspect of the question, but it might easily be shown that mentally and morally the allotment has immense possibilities for training and improving the people, whatever may be their position in the social scale. On the financial side also there can be no doubt that "it pays." We therefore heartily endorse the suggestion of our contemporary, the *Architects and Builders' Journal*, that "provision for allotments should be compulsory for every lay-out of a suburban estate," whether intended for the working class or the business man.

QUEEN MARY'S NEEDLEWORK GUILD.

ONE of the first of the demands of the war was for clothing for sailors and soldiers, for naval and military hospitals, and for the families of fallen sailors and soldiers who might suffer. This was immediately recognised with womanly intuition on the outbreak of hostilities by Her Majesty the Queen, who formed the Needlework Guild which bears her name. For four and a half years a devoted band of helpers have been working at Friary Court, St. James's, often for 10 or 11 hours a day, which has throughout remained the central clearing-house of the Guild. From a first weekly consignment of 5000 articles of clothing to the regiments and hospitals in the early days of the war the numbers went up until during one week 586,000 articles were despatched. More than 14 million articles of various kinds have passed through the packing departments of Friary Court, not only clothing but comforts of almost every description. This, however, represents only a part of the total, for many of the 620 branches sent their work direct to local hospitals and county regiments. The membership of the Guild came to exceed a million, and branches were formed all over the world. The work has now been discontinued, but it is hoped to utilise the remarkably successful organisation in the interest of discharged sailors and soldiers. The orthopædic branches of the Guild still remain in active working.

THE TREATMENT OF ADENOIDS.

To the Editor of THE LANCET.

SIR,—Considerable interest has been aroused in the method of treating adenoids originated, I understand, by Mrs. Handcock and advocated by Dr. Isabel Ormiston in your issue of August 24th, 1918. In her paper Dr. Ormiston refers to a sternutatory powder composed of iris root and hard soap.

The roots of several varieties of iris are used—more or less—medicinally, including that known commonly as orris root. Would any of your readers oblige by communicating the exact prescription for the powder, or by acquainting me with references to further details of the method of treatment? I am, Sir, yours faithfully,

Feb. 6th, 1919. M.D.

Communications, Letters, &c., to the Editor have been received from—

A.—Col. J. G. Adami, A.D.M.S., Messrs. Allen and Hanburys, Lond.; Dr. D. K. Adams, Glasgow.

B.—Dr. A. E. Blackburn, Bournemouth; Capt. F. W. Baker-Young; Mr. H. Blakeway, Lond.; Dr. P. G. Byrne, Clonmel; Dr. R. Donaldson, Reading; Major-General Sir D. Bruce, K.C.B., A.M.S.; Dr. H. Brown, Lond.; Messrs. Butterworth and Co. (India), Ltd., Calcutta; Board of Agriculture and Ministry of Food, Lond., Joint Committee of; Prof. Dr G. Breccia, Vicenza; Messrs. P. Blakiston's Son and Co., Philadelphia; Lt.-Col. H. N. Barrett, R.A.M.C.; Dr. B. G. M. Baskett, Rayleigh; Dr. E. A. Barton, Lond.; Capt. H. H. Butcher, R.A.M.C.

C.—Dr. C. Coombs, Bristol; Mr. C. A. Clouting, New York; Messrs. Cassell and Co., Lond.; Sister J. Church, Lond.; Capt. J. Campbell, R.A.M.C.; Conjoint Board of Scientific Societies, Lond.; Dr. A. C. Coles, Bournemouth; Dr. A. J. Chalmers, Khartoum; Dr. E. L. Collis, Lond.

D.—Dr. L. Drage, Hatfield; Dr. H. H. Dale, Lond.; Dr. V. Dickinson, Lond.; Dr. H. Dickinson, Lond.; Dr. J. R. Day, Lond.; Dr. J. F. H. Dilly, Lond.

E.—Dr. H. A. Ellis, Middlesbrough.

F.—Fiat Press Bureau, Lond.; Major E. R. Fothergill, R.A.M.C.; Mr. E. R. Flint, Leeds; Lt.-Col. F. E. Fremantle, R.A.M.C.(T.); Mr. C. H. Fagge, Lond.

H.—Dr. F. Hernaman-Johnson; Mr. W. Hurst, Glasgow; Mr. C. R. Hewitt, Lond.; Dr. C. W. Hutt, Brighton; Mr. N. B. Harman, Lond.; Mr. C. J. Heath, Lond.

I.—Indian Science Congress, Bombay, Hon. Sec. of; Insurance Practitioners' Associations of Camberwell, Lambeth and Southwark.

J.—Major W. Johnson, R.A.M.C.; Dr. G. P. Joy, Lond.; Mr. R. E. Jones, Llanberis.

L.—Mrs Leggatt, Woodford-Green; Local Government Board, Lond.; Dr. O. Leyton, Lond.; Messrs. Lawson and Co. (Bristol), Ltd., Bristol; Prof. F. de Lapersonne, Paris; Dr. N. P. Laing, Llandudno; London Inter-Collegiate Scholarships Board, Sec. of; Mr. E. M. Little, Lond.; Miss H. Lowry, Lond.

M.—Mr. L. Moochnik, Lond.; Capt. J. Miller, R.A.M.C.(T.); Dr. G. A. Macdonald, Wokingham; Mr. C. MacMahon, Lond.; Lt.-Col. C. S. Myers, R.A.M.C.; Medico-Psychological Association of Great Britain and Ireland; Mr. A. P. Melville, Edinburgh; Sir W. Milligan, Manchester; Dr. R. F. Moorshead, Lond.

O.—Dr. H. P. Orchard, Lond.; Mr. J. Offord, Lond.

P.—Prof. A. Pellegrini, Chiari; Mr. C. J. Pilling, Philadelphia; Mr. J. A. P. Perera, Lond.; Mr. D'Arcy Power, Lond.; Major J. Phillips, R.A.M.C.; Dr. J. Pearse, Lond.

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